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OF THE INTERIOR

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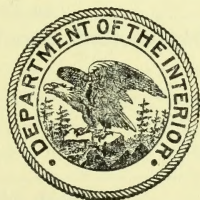
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ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR



FOR THE FISCAL YEAR ENDED JUNE 30

1928



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR

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DEPARTMENT OF THE INTERIOR

<i>Secretary of the Interior</i>	ROY O. WEST. ¹
<i>First Assistant Secretary</i>	EDWARD C. FINNEY.
<i>Assistant Secretary</i>	JOHN H. EDWARDS.
<i>Administrative Assistant</i>	EBERT K. BURLEW.
<i>Chief Clerk of the Department</i>	WM. BERTRAND ACKER.
<i>Solicitor</i>	ERNEST O. PATTERSON.
<i>Assistant to the Solicitor</i>	ORLIN H. GRAVES.
<i>Member, Board of Appeals</i>	GEORGE B. GARDENER.
<i>Member, Board of Appeals</i>	WILLIAM B. NEWMAN.
<i>Member, Board of Appeals</i>	ALVAH W. PATTERSON.
<i>Commissioner of the General Land Office</i>	WILLIAM SPRY.
<i>Assistant Commissioner, General Land Office</i>	THOMAS C. HAVELL.
<i>Commissioner of Indian Affairs</i>	CHARLES H. BURKE.
<i>Assistant Commissioner of Indian Affairs</i>	EDGAR B. MERITT.
<i>Commissioner of Pensions</i>	WINFIELD SCOTT.
<i>Deputy Commissioner of Pensions</i>	EDWARD W. MORGAN.
<i>Commissioner of Education</i>	VACANT. ²
<i>Director of the Geological Survey</i>	GEORGE OTIS SMITH.
<i>Commissioner of Reclamation</i>	ELWOOD MEAD.
<i>Assistant Commissioner of Reclamation</i>	PORTER W. DENT.
<i>Director of the National Park Service</i>	STEPHEN T. MATHER.
<i>Assistant Director, National Park Service</i>	ARNO B. CAMMERER.
<i>Assistant Director, National Park Service (Field)</i> ...	HORACE M. ALBRIGHT.
<i>Governor of Alaska</i>	GEORGE A. PARKS.
<i>General Manager, The Alaska Railroad</i>	OTTO F. OHLSON. ³
<i>Governor of Hawaii</i>	WALLACE R. FARRINGTON.
<i>Superintendent, St. Elizabeths Hospital</i>	DR. WILLIAM A. WHITE.
<i>President, Howard University</i>	MORDECAI W. JOHNSON.
<i>Surgeon-in-chief, Freedmen's Hospital</i>	DR. WILLIAM A. WARFIELD.
<i>President, Columbia Institution for the Deaf</i>	DR. PERCIVAL HALL.

¹ Appointed July 25, 1928, vice Hubert Work.

² John J. Tigert resigned, effective Aug. 31, 1928.

³ Appointed Aug. 1, 1928, vice Noel W. Smith.

FUNCTIONS OF THE DEPARTMENT OF THE INTERIOR

The United States Department of the Interior, established by the act of March 3, 1849 (9 Stat. 395), is the land, home, and education department of the Government. Its work is a permanent contribution to the educational, scientific, historical, and conservation functions of the Government. It is a fact-finding department for internal development. Its mission is largely educational and many of its activities are devoted to the discovery and dissemination of knowledge. It contributes to education through its Bureau of Education. It operates directly 205 schools for the American Indians and 86 for the native Alaskans. It maintains Howard University, training schools for nurses at Freedmen's and St. Elizabeths Hospitals, with a graduate school for psychiatrists at the latter, and the Columbia Institution for the Deaf. Its work in the General Land Office, Geological Survey, and the Bureau of Reclamation touches the scientific field; through the National Park Service it handles the national playgrounds of the people; and through the Pension Office it handles large financial transactions involved in the payment of pensions to veterans of the wars.

GENERAL LAND OFFICE.—Originally organized as a bureau of the Treasury Department under the act of April 25, 1812 (2 Stat. 716), and transferred to the Interior Department in 1849, the General Land Office has control of the public lands, including their survey, handling applications for homesteads and Indian allotments, desert land and mining claims, and mineral leases. Has jurisdiction over granting railroad and other rights of way and easements on public lands and adjusting State and railroad land grants.

BUREAU OF INDIAN AFFAIRS.—Originally organized as a bureau of the War Department under the act of July 9, 1832 (4 Stat. 564), and transferred to the Interior Department in 1849. Acts as the official guardian of the Indians; promotes their health and physical welfare; directs the education of Indian children; encourages their native arts and crafts; reclaims their lands and develops the natural resources in timber and minerals; supervises their funds; adjusts heirship matters and handles all Indian affairs of the Government.

BUREAU OF PENSIONS.—Originally organized as a bureau of the War Department under the act of March 2, 1833 (4 Stat. 622) and made a part of the Interior Department in 1849. Handles the pension claims and pays pensions for all the wars of the United States except the World War. Administers the civil service retirement act, handling and paying annuities to retired employees of the Government.

BUREAU OF EDUCATION.—Established as a department under the act of March 2, 1867 (14 Stat. 434), and became a bureau of the Interior Department in 1869 (15 Stat. 106). Furthers education by the compilation and dissemination of data covering education in the United States and foreign countries; conducts university, college, and school surveys, including experiments in education; operates Government schools for the natives of Alaska, and has supervision of the development of the reindeer industry of the Territory.

GEOLOGICAL SURVEY.—Established under the act of March 3, 1879 (20 Stat. 394). Makes topographic and geological maps of the United States and Alaska; studies the surface and underground water resources; prepares and distributes reports on gold, silver, petroleum, and other mineral deposits; and, through a

conservation branch, classifies public lands and supervises engineering phases of mineral leasing.

BUREAU OF RECLAMATION.—Established under the act of June 17, 1902 (32 Stat. 388), for the purpose of developing agricultural possibilities of the arid and semiarid regions of the United States. This bureau constructs and operates irrigation works; collects annual payments from water users for cost of irrigation; promotes knowledge of irrigation methods, suitability of crops, availability of markets, and improvement of farm homes.

NATIONAL PARK SERVICE.—Established by the act of August 25, 1916 (39 Stat. 535), this bureau conserves the natural beauties and unique characteristics of the national parks and monuments under its control and promotes their use for the health and recreation of the people. It also protects and restores ruins of ancient civilization and the flora and fauna of the parks.

ALASKA RAILROAD.—Construction authorized by Congress under the act of March 12, 1914 (38 Stat. 305), and completed in 1923 at a cost of \$60,000,000. This Government owned and operated road extends for a distance of 467 miles into the interior of Alaska, transporting passengers, freight, express, and mail.

ST. ELIZABETHS HOSPITAL.—Established under the act of March 3, 1855 (10 Stat. 682), this is a class A institution for the treatment of mental diseases of the Army, Navy, and District of Columbia. The daily average number of patients treated is 4,200 and its average number of employees is 1,280.

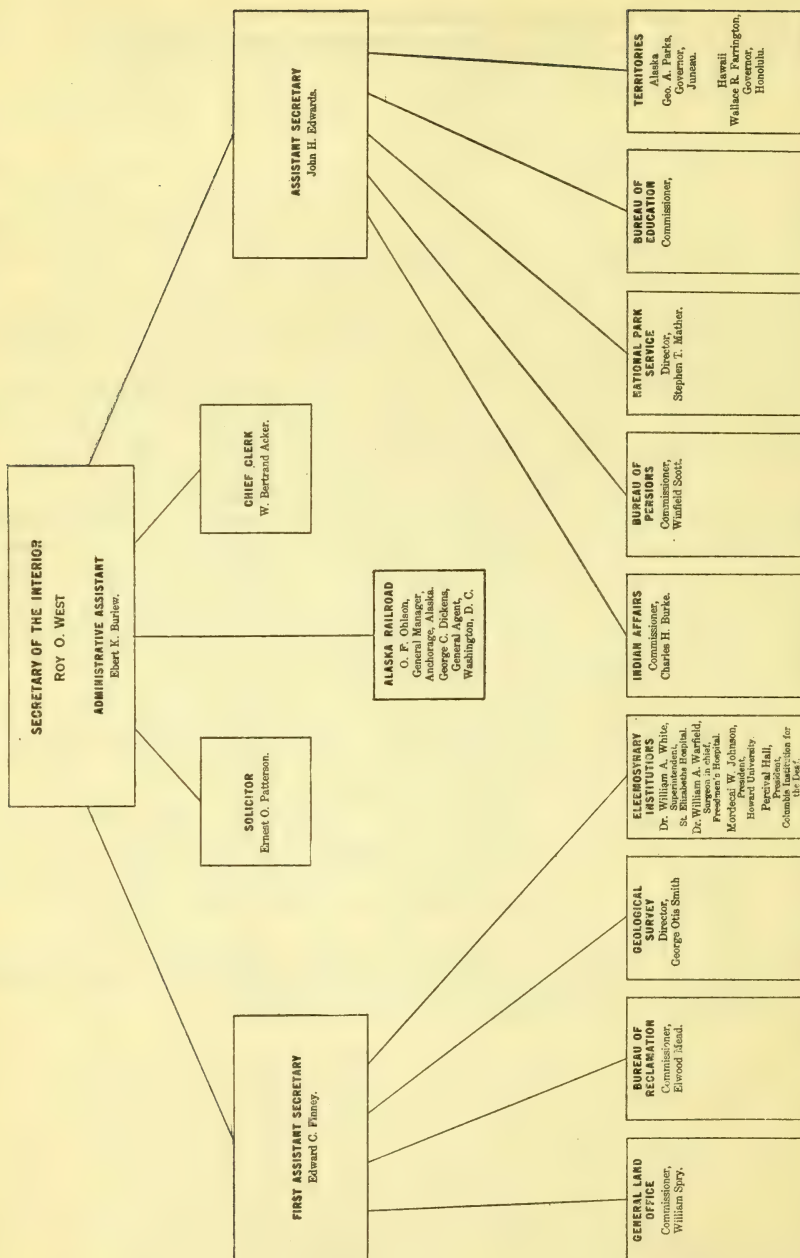
FREEDMEN'S HOSPITAL.—Established under the control of the War Department by act of March 3, 1871 (16 Stat. 506), and transferred to Interior Department by act of June 23, 1874 (18 Stat. 223). This hospital provides medical and surgical treatment for the colored race, its patients including indigent residents of the District of Columbia, residents of the several States, emergency cases, and regular pay patients. It cares for approximately 4,318 indoor patients and 10,984 outdoor patients annually.

HOWARD UNIVERSITY.—Established by the act of March 2, 1867 (14 Stat. 438), this is an institution of higher education of the colored youth of the Nation in liberal arts and sciences, medicine, law, and religion. The enrollment of students is over 2,000 annually, with 273 graduates every year.

COLUMBIA INSTITUTION FOR THE DEAF.—Established under the act of February 16, 1857 (11 Stat. 161). This institution cares for deaf mutes of the States and Territories and the District of Columbia. It reports annually to the Secretary of the Interior and certain of its beneficiaries are admitted to the institution under that officer.

TERRITORIES.—Alaska and Hawaii are directly represented by the Secretary of the Interior in the official family of the President, many of various Federal activities in these Territories being under his supervision.

DEPARTMENT OF THE INTERIOR



Sept. 1, 1928.

ORGANIZATION CHART



INTERIOR DEPARTMENT BUILDING

LETTER OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR,

Washington, D. C., November 20, 1928.

SIR: I have the honor to transmit herewith my annual report on the operations of the Interior Department for the fiscal year ended June 30, 1928.

In presenting this report attention is called to the fact that it covers the administration of my predecessor in office, Hon. Hubert Work, whose resignation was effective on July 24, 1928, after more than five years of noteworthy and diligent service on behalf of the Government. My term of office, therefore, at the time of the preparation of this report has been brief, and did not cover the period reported; but it has been sufficient in duration for intensive study of the affairs of the department. I have been impressed with the magnitude of its functions. The numerous unrelated activities of the department as reorganized by Secretary Work represent well-knit units which give their administrative allegiance to the Secretary of the Interior, and their condition bears witness of the creditable administration of Secretary Work.

The resignation of Dr. John J. Tigert on August 31, 1928, which was in contemplation before my appointment, marked the termination of more than seven years of active service as Commissioner of Education. I view his departure as a public and personal loss.

In the foreword of this report I have discussed some of the more important problems now under consideration by the department. The nature of these problems emphasizes the necessity for personal contact in the field for the purpose of acquiring intimate knowledge of activities that fall under the administration of Interior officials. A thorough comprehension of the many and varied problems constantly arising for decision can be secured only in this way. The broader and more accurate view thus gained should insure more satisfactory and prompt action.

Indian affairs and reclamation represent the more pressing subjects that have had my attention. I have inspected these activities in Montana, Wyoming, Arizona, and New Mexico since taking office. The proposed contract with the Middle Rio Grande conservancy district, which the department is authorized by Congress to make on behalf of the Pueblo Indians, was the occasion of my personal inspection for two days on foot and by motor of about 100 miles of territory in New Mexico comprised in the proposed irrigation district; in Arizona I visited the Salt River reclamation project and the proposed Paradise-Verde irrigation district; I personally held a public hearing at Safford, Ariz., which was attended by about 2,000 settlers in the Gila River Valley. They are urging more adequate irrigation of their lands from the headwaters of the Gila River.

Others of my particularly active contacts with the department's work have been in the field of Indian education. The report of the Institute for Government Research, covering every phase of the Government's administration of Indian affairs, is now before the department for action. This survey, made without cost to the Government, was requested by my predecessor, who recognized the need for informative study of this important subject.

Attention was called last year to the change in the form of the annual reports of the department, made under authority of the act of Congress approved February 23, 1927. This saving to the printing fund, resulting from the consolidation of the reports of the bureaus, last year amounted to \$959.16. This year a further saving has been effected, estimated at approximately \$2,000. This has been accomplished by omitting the maps theretofore appended to the reports of the department and of the Territories of Alaska and Hawaii and the omission of the tables of figures from the press edition. Thus the total estimated cost of the present annual reports is \$7,628.73, as compared with \$10,587.89 for the reports as printed two years ago.

Very respectfully,

ROY O. WEST, *Secretary.*

The PRESIDENT.

REPORT OF THE SECRETARY OF THE INTERIOR

FOREWORD

THE YEAR'S WORK IN BRIEF

THE business of the department at the close of the fiscal year was practically current. Owing to progressive decreases in the number of employees over a period of several years and to expansion of departmental activities, it was not possible to show a reduction in force as compared to the previous year. The volume of business conducted by the department as a whole was greater, however, which was made possible only by improvement in methods and an increased output by the employees carried on the rolls. The raise in the standard of pay provided by the Welch Act has resulted in a better satisfied personnel. As hereinafter mentioned, there was a net increase in appropriations for the year, as compared to 1927, of \$8,547,183.71. It is gratifying to report that \$4,365,021.06 of this amount was for the benefit of the American Indians.

During the year the General Land Office collected over six and a half million dollars, or three times the cost of administration. The low price of oil during the year discouraged production on Government land, resulting in reduced receipts and consequently less royalty to the Government. The total receipts under the mineral leasing act, including oil royalty, aggregated \$4,677,277.16. Income from other sources compared favorably with that of recent years. The total area embraced in original public land entries allowed during the year was 3,726,421 acres, as compared with 3,594,838 acres for the previous year. Filings were made to the number of 26,267 on public lands. The surveying service accomplished the survey of 2,937,688 acres. Examinations on the ground were made in more than 17,000 cases, 12,324 being reported favorably to claimants and 5,333 adversely.

As a result over 153,000 acres were restored to the public domain. Three hundred and thirty-three hearings were held. Civil suits were recommended to the Department of Justice in 64 cases. Twenty-one indictments for violations of the statutes were secured, and a sum of over \$38,000 was turned into the Treasury, nearly \$27,000 of that amount being in settlement of timber trespasses. During the year there were issued over 12,500 patents conveying title to nearly 3,000,000 acres; and over 4,400 permits to prospect for oil and gas, 83 coal prospecting permits, 85 potash permits, and 14 sodium permits.

The Bureau of Reclamation confined its construction activities during the year to projects already commenced under the 10-year program. Considerable progress was made on the six dams under construction in California, Montana, Oregon, Utah, and Washington. The irrigable area on Federal projects and of adjacent land served with Federal storage water under Warren Act or other water service contracts during the 1927 season was 3,439,860 acres, an increase of 266,290 acres over the previous year. The total value of crops in 1927 on lands supplied with water from Federal works was \$133,207,-210, an increase of \$23,087,550 over 1926. Collections from project water users showed an increase of \$1,038,928.20 in 1928 over the previous year.

The Bureau of Pensions in the last fiscal year adjudicated 147,620 pension claims, a decrease over the previous year of 13,136 claims. The act of May 23, 1928, automatically increased the pensions of 103,000 Civil War widows who were 75 years of age or over from \$30 to \$40 per month. In order to determine what pensioners were entitled to this increase it was necessary to withdraw from the files and examine approximately 171,000 cases. There was a net reduction of 53 in the number of employees in the bureau. This was effected by permitting vacancies to lapse.

The report of the Institute for Government Research, which made perhaps the most comprehensive survey of Indian affairs ever undertaken, was received near the close of the fiscal year and is now being studied by the department. An engineering survey of the principal irrigation projects of the Indians was made during the year and the comprehensive report and recommendations submitted are having the attention of the officers of the department. An appropriation of

\$25,000 for the employment of graduates of agricultural colleges, scientifically trained and qualified, to supervise the agricultural activities of the Indians will partially fill a long-felt need in the Indian Service. The various State colleges and universities of the Western States cooperated in working out the problems of Indian agriculture and stock raising. Farmers' short courses were held during the fall and winter of 1927-28, faculties volunteering their services and officials tendering the free use of buildings and equipment. There has been an increase in the enrollment of Indians in the junior high and senior high school years, the increase in 1928 over the prior year being 428 in the former and 231 in the latter. The reorganization of the Indian medical service, which was put into effect in 1926, resulted in better coordination of health activities. Cooperative arrangements have been made with other Federal health agencies; also with those which are State, local, and voluntary. An authorization of an appropriation of \$1,200,000 has been obtained to buy lands for the large number of Navajo Indians in New Mexico and Arizona scattered over the public domain. The Coolidge Dam, on the Gila River in Arizona, under construction at an estimated cost of \$5,850,000, including hydroelectric power development, to impound waters for adequate irrigation facilities for the Pima Indians, will be completed in the immediate future. By an agreement with the Salt River Valley Water Users' Association and the Paradise-Verde power and irrigation district, provision is made to insure an adequate water supply for the Pima Indians on the Salt River Reservation. This will satisfy a need of many years.

The Bureau of Education has completed the survey of negro colleges and universities, and the report is now issuing from the Government Printing Office. The survey of land-grant colleges will be completed during 1930. The bureau cooperated during the year with the Bureau of Naturalization in the formulation of plans for preparing aliens for citizenship, with the Department of Justice in devising an educational program for Federal prisons and reformatories, and with the Department of Commerce in outlining a proposed survey of certain occupations related to merchandising. Preliminary steps have been taken for a survey of Indian schools. The Commissioner of Education called and held important conferences on various phases of rural education, rural teacher preparation, supervision in

city school systems, platoon schools, and home economics. The biennial statistics of education were brought more nearly to date, practically all the 1926 statistics being available in 1927.

The National Park Service during the year served 3,026,273 visitors to national parks and monuments, an increase of 228,433 persons over the previous high record of 1927. A new national park, Bryce Canyon, was established on September 15, 1928, under authority of the acts of Congress approved June 7, 1924, and February 25, 1928, and was dedicated on September 16, 1928. An agreement was reached between the Secretaries of War and Interior whereby recommendation was made to Congress for the transfer from the jurisdiction of the War Department to that of the Interior Department of 10 national military and other parks and 9 national monuments to be known as national historical parks. A bill authorizing this transfer was passed by the Senate but has not yet been acted upon by the House of Representatives. Funds were donated for study and report on educational possibilities of the national park system, as well as for construction of museums in the Yellowstone Park. Archeological investigations were carried on in national parks and monuments containing prehistoric structures. Under the park service road budget 272 miles of new highways have been completed and 261 miles are now under construction. Revenues received from the national parks and monuments in 1928 amounted to \$808,255.81, an increase of \$104,406.21 over the 1927 revenues.

In the Geological Survey steady progress was made in the task of making a topographic map of the entire country; this work is being pursued chiefly in cooperation with the States, which contribute about half the cost. A new stereoscopic apparatus for making contour maps from overlapping photographs was purchased and is expected to revolutionize topographic mapping in mountainous countries. Geologic investigations of the year were mainly continuations of studies of the metalliferous resources and the oil and coal fields of the Western and Southwestern States, and general studies of other mineral resources and of the physiography and geologic history of the entire country. Continued search for potash has proved the presence of deposits large enough to be of possible economic interest at two localities in Texas and at one locality in New Mexico. Volcanologic studies, already under way at stations in Hawaii and Alaska, have

been extended on a small scale to California. Five geologic and topographic exploring and mapping projects were under way in Alaska during the summer of 1928. The transportation by airplane of survey men and supplies into an area difficult of access demonstrated the practicability of thus lengthening the field season and facilitating exploratory work. The number of stream-gaging stations was increased from 1,749 to 1,830, and seven new ground-water investigations were started. Cooperation was begun with the State Department in obtaining systematic records of rivers which flow across or along the Canadian and Mexican boundaries and as to which international questions are pending or are imminent. A report was issued on power capacity and production in the United States, presenting a statistical view of the growth of the power industry. Supervisory work under the mineral leasing laws on lands containing publicly owned mineral deposits was extended to 4,631 new leases, licenses, and prospecting permits issued during the year.

The population of the Territory of Hawaii increased during the year by 15,347. The alien population, excluding the Filipinos, has decreased by 2,205; the citizen population has increased by 10,658. A high standard of health and prosperity has continued to prevail in the islands. Agriculture has prospered. A notable feature of the sugar industry is the steadily increased per acre production. Pineapple producers have found a good market for large quantities of their canned output. The coffee industry is prospering, the area planted having increased during the year. Total bank deposits amounted to \$80,210,063.69, of which \$31,278,434.34 are in savings banks, an increase of savings deposits of \$4,176,214.46. The year 1928 marks the celebration of the one hundred and fiftieth anniversary of the discovery of the Hawaiian Islands by Capt. James Cook.

The industrial conditions and the economic situation in Alaska were in general as satisfactory as could be expected, considering the decline in the catch of salmon. Labor was well employed. There were no widespread epidemics. The balance in the Territorial treasury at the close of business December 31, 1927, was \$772,058.59, the largest closing balance for any year within the decade. Customs reports disclosed a decrease in shipments from Alaska to the United States and an increase in the value of shipments to the Territory.

The outlook for an early development of the pulp and paper industry, it is stated, has never been more encouraging. Large crews of timber cruisers are in the field estimating available timber, engineers are studying water power for the purpose of submitting plans for its development, and the early construction of hydroelectric units is anticipated. It is estimated that within the next four years the manufacture of paper will take its place as one of the major industries of the Territory. For the first time in many years the production of coal in the Territory greatly exceeded the importation of this commodity from foreign sources. The total domestic consumption was 166,000 tons, of which 104,300 tons, valued at \$548,000, were mined in Alaska.

The Alaska Railroad management continued its work of completion and improvement during the year. Pursuant to the regular program, gravel fills were substituted for wooden bridges and trestles wherever possible. Wherever it has been necessary to leave openings for the passage of streams or flood waters, concrete culverts or steel bridges on concrete piers have been installed, so maintaining the roadway as to reduce maintenance in the future. At many points the track has been raised for better drainage facilities. No new equipment was purchased during the year. In road operations a persistent effort was made to reduce expenses and to increase revenues with the result that while the deficit for the fiscal year 1927 was \$900,174.67, for the fiscal year 1928 it fell to \$840,890.93. There was an increase of \$118,051.76 in operating revenues.

The number of patients at St. Elizabeths Hospital increased by 211 during the past fiscal year. This is a greater increase than for many years. During the year an appropriation of \$875,000 was authorized for a new medical and surgical hospital building. The plans for this building are well under way and it is hoped that construction will begin in the spring. This will provide about 200 additional beds and will make available the most modern facilities for the care of physical illness. The new building will form the nucleus of the medical center of the institution, the future building program contemplating new receiving buildings immediately adjoining for both sexes. Progress is noted in the work of the training school, the occupational therapy department, the Red Cross and the social service department, while the administrative department reports a

prosperous year throughout. Farm and garden products have increased in quantity and value, as has the output of the various related industrial establishments. The power, heating, and lighting plant has been remodeled and newly equipped.

Howard University had an enrollment of 2,563 students, the largest in its history. The new laboratory building for medicine was ready for occupancy on October 1, 1927. Following a thorough survey of the law school by Mr. H. C. Horack, secretary of the American Association of Law Schools, the trustees voted to inaugurate a 3-year full-time day school and a 4-year part-time evening school under conditions acceptable to that association. The law school and departments of social science received gifts aggregating \$30,000 from the Laura Spelman Rockefeller Memorial for improvement of library facilities.

Freedmen's Hospital received for treatment 29,501 patients during the year, the number exceeding that of the preceding fiscal year by 4,842. Two thousand three hundred and sixty-one surgical operations were performed, the majority being of a major nature. In the obstetrical department 390 births occurred, 64 more than last year. The hospital admitted 1,005 pay patients and 501 others were treated in the dental department. While there was increased activity in all departments, that in the X ray and pathological exceeded that of any previous year. These laboratories provided an abundance of clinical material for students of Howard University Medical College. Twenty-five internes and two externes were trained in all the branches of medicine. Seventy student nurses received a full course of instruction and two graduate nurses were given special courses in the pathological laboratory. An electrocardiograph was installed for diagnosis.

FINANCES

The appropriations for the fiscal year 1928, including deficiency appropriations, and deducting the \$37,999,998.50 advanced for payment of pensions in 1927, aggregated \$299,918,985.55, an increase of \$8,547,183.71 over the fiscal year 1927. The principal items entering into this increase were \$4,365,021.06 for the Bureau of Indian Affairs, \$4,720,440 for the Bureau of Reclamation, and \$955,765 for the National Park Service. These increases were offset in part by decreases of \$1,104,997 for the Bureau of Pensions and \$374,708 for the Territories of Alaska and Hawaii.

The unexpended balances reverting to the Treasury from appropriations for the fiscal year 1928 amounted to \$1,415,544.57, as compared to \$1,966,245.07 for the fiscal year 1927.

The receipts of the department from all sources for the fiscal year 1928 amounted to \$36,087,975.72, as compared with \$46,030,331.52 for the preceding year, a decrease of \$9,942,355.80. This decrease was due chiefly to the falling off in receipts under the mineral leasing act and in proceeds from sales of leases of Indian lands and timber.

PERSONNEL

At the close of the fiscal year 1927 there were 11,525 permanent employees on the rolls in Washington and the field; at the close of the fiscal year 1928 there were 11,775. The monthly average number of temporary employees was 3,546, as compared with 2,691 for the previous year. The turnover for the permanent force in Washington was 59 per cent, as compared with 55 per cent for last year.

The appropriations and allotments for salaries of employees for the year were \$18,065,654.67; the amount spent was \$17,523,129.17, a net saving of \$542,525.50, or 3 per cent of the appropriations and allotments.

The so-called Welch Act, approved May 28, 1928, providing for horizontal increases of Government salaries, became effective July 1, 1928. The result was to increase the average of the annual salaries in this department from \$2,110.81 to \$2,307.40. The cost of the act to this department on an annual basis for the fiscal year 1929 is estimated at \$1,235,893.26.

On June 15, 1928, there were 2,080 employees in Washington, exclusive of St. Elizabeth's and Freedmen's Hospitals. Of that number, 1,433 received less than the average salaries of their respective grades, 387 more, and 260 were receiving the average salaries. On July 1, after the Welch Act became effective, the number receiving less than the average was 1,700; above average, 392; receiving average salaries, 2. It is apparent that the effect of the Welch Act was to increase the numbers of those below and above average and to decrease very materially the number who receive the average salaries of their respective grades. This is because the act, while raising the pay standard, at the same time raised the authorized grade averages, and to the fact that in only four grades do the mathematical averages now correspond to any of the rates within the grades.

Promotions were approved during the year to the amount of \$86,120 on an annual salary basis. These promotions were based on efficiency records of employees, and, as in previous years, funds became available from lapsed salaries, with no direct appropriation for promotions by Congress.

LEGAL WORK

Legal questions arising in the administration of the department cover a wide range and involve matters relating to soldiers' pensions, public lands, Indian affairs, national parks, reclamation projects, and miscellaneous matters. Not all the questions presented are finally settled in the department, as many result in prolonged litigation in Federal and State courts. While most of the court work is handled by the Department of Justice, the legal force of this department actively cooperates with the Justice officials in the conduct of Interior litigation.

The recent requirement that all matters arising in the bureaus of the department and involving questions of law shall be routed through the office of the solicitor, has secured uniformity in rulings. The wisdom of this policy is reflected in court decisions upholding the department and thereby safeguarding the interests of the Government. During the year 47,328 cases passed through the solicitor's office, an increase of 10,735 over the preceding year. A classification of these cases is published in the appendix of this report.

Litigation affecting the department and brought in the courts of the District of Columbia is handled by the office of the solicitor. During the year the Supreme Court of the District has handed down opinions in 22 such cases, in 14 of which no appeals have been taken. Five cases were finally disposed of by the District Court of Appeals, in each of which the decision upheld the department. There are 15 cases now pending in the Supreme Court of the District of Columbia and 6 in the court of appeals.

Disposition of a large area of oil shale lands is the subject of pending litigation, involving the construction of a statute. The department has denied the right of applicants to acquire title to these lands, and they have instituted suit to test that ruling. This case is now before the Court of Appeals of the District of Columbia on appeal from a decision of the Supreme Court of the District sustaining the action of the department. A series of cases of a similar nature and involving

valuable coal lands has been disposed of by a final decision of the Supreme Court of the United States handed down during the year. The court upheld the position of the department denying the right of the applicants to a patent. All attempts to reverse the decisions of the department in adjustments of claims, aggregating millions of dollars, under the so-called "war minerals relief act" so far have been unsuccessful.

EDUCATION OF THE INDIANS

The administration of the Bureau of Indian Affairs of this department touches a variety of human activities. On behalf of about 350,000 Indians, it administers educational institutions and sanatoria, purchases all kinds of articles and supplies, and employs a wide range of personal service, including that of laborers, farmers, teachers, nurses, physicians, and lawyers. It erects and maintains roads, bridges, buildings, and irrigation projects. Its forestry service has custody of some of the country's most valuable timber reserves. The bureau buys and sells lands. As trustee for Indians owning beneficial interests in real and personal property, it supervises individual and tribal values aggregating \$1,700,000,000. Legal questions, too, are involved in much of the bureau's current work. Direction and supervision of Indians in industry, in agriculture and stock raising, and in other pursuits are influential factors in the efforts of the bureau to assimilate Indians with our population and to help them to economic independence.

In furtherance of such purpose, the bureau has constructed schoolhouses and has employed teachers. Wherever conditions permit, Indian children are placed in public schools, local districts being reimbursed for tuition. Last year there were about 35,000 Indians in public schools, but the total appropriation of \$350,000 for tuition was soon exhausted and many applications were refused. An appropriation of \$375,000 was secured for the current year, but that fund is already nearly exhausted. No tuition is paid for children of less than one-fourth Indian blood, nor for those of families whose taxable holdings within the district exceed their nontaxable holdings.

It has been found that attendance of Indian children in public schools near their homes benefits both children and their families. Incidentally, it effects a saving of public funds, as many of the children for whom tuition is paid otherwise would be placed in Government boarding schools at Government expense.

However, the segregation on reservations of Indian children during their earlier years, the nomadic life of their parents and of a large proportion of the population, and the frequent controversies and complications as to property rights make it impossible for approximately one-half the Indian children to be provided with public-school facilities. Consequently, the Indian Service now maintains for these children 204 schools, with a capacity of 26,000 pupils, and about 5,000 pupils attend mission schools supported by religious denominations. The appropriation last year for Indian education, exclusive of public-school tuition, was \$5,923,000. During the last six years Congress has increased appropriations in support of Indian education by \$2,898,825, which has made it possible to improve school buildings, to increase the number of grades, to raise the standard of teaching, and to place more children in school.

But there is opportunity for greater advancement in methods of Indian education and for improvement of the facilities provided for children of school age. Until recently the courses offered Indians were all of elementary grades. No complete high-school courses were taught for them until 1921, and then at only one school. In 1925, three such courses were added; one was added in 1926 and a fifth in 1927. The increase during the last three years in the number of pupils—junior and senior grades—has been by 1,178 in the former and by 526 in the latter. There are now only six institutions maintained by the Federal Government where Indians may receive a high-school education. Elementary and junior high-school courses are also taught in these institutions, the senior high-school grades constituting only one department. There is not an Indian school in the United States that is strictly a high school.

Contrast these conditions with the educational advantages offered the white population. During the last decade high-school enrollment in the United States has increased from 1,600,000 to 4,000,000. There are enrolled in colleges, universities, and other institutions of higher learning nearly a million young men and women, and untold thousands of youths and adults attend night and continuation schools. The enrollment in the public high schools in the United States is approximately 1 to every 6 pupils of school age, while among Indians it is only 1 to every 20. The aggregate number of Indians in institutions of higher learning or who are pursuing extension courses is negligible.

The yearly allotments for the support of Indian schools vary from \$230 to \$260 for each student, or from \$4.73 to \$5 per week. The increase in these allotments in the last 10 years ranged from only 10 to 20 per cent. Let this per capita cost be compared with the following statistics showing the increase in the weekly cost per student, for example, in Wisconsin State institutions, and note that in Wisconsin during the last 10 years it has almost doubled.

	1916	1926
State hospital	\$4.92	\$7.67
General hospital for insane.....	6.72	10.17
State sanatorium.....	10.39	17.03
State prison.....	3.90	6.29
State reformatory.....	5.14	7.26
Industrial school for boys.....	3.84	8.99
Industrial school for girls (1918).....	4.02	(1928) 8.64
State school for deaf.....	5.91	11.61
State school for blind.....	8.12	15.72

Shortage of funds for the support of Indian schools makes it impossible to equip them adequately. Expenditures for such essentials as textbooks, library books, maps, miscellaneous classroom supplies and equipment, furniture for dormitories, machinery for shop and farm are so limited as to decrease efficiency. Paucity of textbooks may be the most serious handicap, particularly since no school has an ample supply of supplemental texts by other authors. Very few schools have libraries, and it is exceptional for a school to make annual purchases of library books. Dormitory rooms are frequently without chairs. Laundry machinery in many cases is out of date, inefficient, and more or less dangerous. Many of the quarters for teachers are not comfortably furnished.

During the year the Institute for Government Research, a non-governmental agency, completed an independent survey of the economic and social conditions of the Indians. The department invited the institute to make the survey, which was begun in 1926. The institute's report was transmitted to the Secretary of the Interior on February 21, 1928. This was the most thorough and comprehensive survey of Indian affairs ever undertaken. The report, which is entitled "The Problem of Indian Administration," comprises 872 pages. It contains many constructive suggestions and recommendations for the betterment of all branches of the service. The officers of the department have been studying it intensively, and some of the

recommendations have already been incorporated in the Indian program.

As the inadequacy of the educational system for the Indians was one of the reasons for the department's request for the survey and report, the following summary of the findings of the investigators on this subject is of especial interest:

The survey staff finds itself obliged to say frankly and unequivocally that the provisions for the care of the Indian children in boarding schools are grossly inadequate.

The diet is deficient in quality, quantity, and variety.

The great protective foods are milk and fruit and vegetables, particularly fresh green vegetables.

The diet of the Indian children in boarding schools is generally notably lacking in these protective foods.

The boarding schools are overcrowded materially beyond their capacities.

The medical service rendered the boarding-school children is not up to a reasonable standard.

The medical attention given children in day schools maintained by the Government is also below a reasonable standard.

The boarding schools are supported in part by the labor of students.

The service is notably weak in personnel trained and experienced in educational work with families and communities.

There is in connection with Indian education a problem to which especial attention is being devoted by the department, viz, the welfare of the Indians after they leave school. The purpose of the department is to develop a constructive plan by which, for a limited time, the Government can supervise them, so that they may become established and adjusted to their white neighbors.

Experience has demonstrated that it is futile to try to make all Indians farmers and stock raisers. Many will not interest themselves in those occupations. It has been believed that the young men and young women who have finished their schooling, perhaps have learned trades and prefer not to return to their reservations, should be encouraged to seek employment elsewhere. Thus many of them have formed lucrative connections in business.

Education of such a primitive people in the conservation and management of their resources is naturally a slow process. Even to-day superstition causes Indian homes to be abandoned because an Indian or Indians have died in them. Startling instances of human suffering in attempts to appease the gods frequently come to notice.

The present Secretary of the Interior recently has visited reservations in Montana, Arizona, and New Mexico, where he inspected the Indian school system—day and boarding—and studied the problem of vocational guidance. For a number of years many Indians, particularly the Apaches, have been employed in Arizona copper mines, but there has been no definite plan for guiding them and little thought has been given to conserving their earnings. It is reported that last year the Apaches on the San Carlos Reservation earned about \$400,000 in mines, on roads, and in the fields, but at the year's end they had no savings. In contrast, the achievements of a group of 120 Indian boys from three schools in New Mexico, who were employed in the sugar-beet fields of Colorado, under close supervision, may be cited. Their earnings aggregated \$17,250 for the summer, and their savings amounted to \$10,180, which they took back to their schools for their own uses.

The wide distribution of the Indians adds to the difficulties of administration. With 200 tribes scattered over 26 States, the problem is complicated not only by distance, but by climate, environment, and tribal customs. The disintegration of tribes and the division of tribal lands among individual families further complicate. Where, formerly, Indians were considered collectively, they now more and more require consideration individually.

It will be recalled that the Fort Belknap Reservation in Montana comprised over 600,000 acres of land, and the Indians at one time had a tribal or communal interest in the total area. This interest was divided in 1925 by approval of allotments to individuals, which separated the former tribal holding into 1,171 parcels. Where previously the business of the reservation was conducted by the bureau as one unit, now each parcel and its owner must receive attention: individual allotments may be leased or sold; heirs must be discovered and their rights adjudicated; allotments may be bartered and exchanged between the Indian owners; patents in fee may issue; taxes are an ever present concern; fraudulent purchases from Indians of their trust lands are attempted and frequently with success; individual complaints of all kinds constantly present themselves.

The issuance of trust patents to individual Indians entails the maximum of care and responsibility for the bureau—until the Indians shall have sold their allotments. Then fee patents issue to the new owners, usually whites.

There are many instances of Indians alienating their lands and dissipating the proceeds, who, left on their own resources, have applied themselves to useful pursuits. They have put to use knowledge and training of their school days with satisfactory results. This applies especially to those Indians who had manual training in school and are equipped for employment in shops, garages, and like industrial plants.

Students of the problems of the Indian quite generally condemn the rationing system, which has encouraged idleness and has deprived the object of the Government's bounty of his independence and manly attributes. It has stimulated the tendency to lease lands for inadequate rentals to enterprising whites, who permit the soil to be impoverished and the crude improvements to depreciate.

In an endeavor to correct such tendencies of the Indian, the bureau has been using a recent appropriation for the employment of six agricultural directors, technically trained as to soils, rotation of crops, breeding of livestock, etc. It is proposed also to assign to each Indian reservation at least one such expert farmer, with duties similar to those of the so-called county agent in agricultural States.

Subject to the efficient execution of a definite program of improvement, it is believed that no better use can be made of tribal funds than the establishment of reimbursable appropriations through which members of the tribe can be assisted in farming, livestock raising, home building, and other industrial operations. Such vocations will elevate the scale of living of the individuals directly benefited and through example react to the good of the whole tribe. To June 30, 1928, some \$1,542,968 of tribal money had been so used, all of which save \$96,350 has been repaid. This unpaid balance is secured by agreements.

Attention is called to this significant statement in the letter of transmittal of the report of the Institute for Government Research:

The members of the survey staff wish me to say clearly in this letter that in almost every activity of the Indian Service they found wide variation between the best and the worst. The best at times approaches the ideal; frequently the survey staff has been able to take as their standard for comparison the attainments of the Indian Service itself. The worst often falls far below the normal.

It may be stated that in certain of the schools visited by the present Secretary of the Interior instruction and recitations compared favorably with those to be heard in schools for white children. The Bureau

of Education of this department has been directed to cooperate with the Indian Service in an effort to improve the educational system of the Indians. This is expected to result in a program conforming to modern methods among whites and yet providing a practical plan suitable to the Indians. It seems clear that the traditional school system of the whites is not immediately applicable in its entirety to the needs of Indian children.

It is hoped that closer cooperation may be established between States having Indian populations and the Federal Government in dealing with questions of education, health, and law enforcement. Probably States should ultimately assume complete responsibility for the Indians within their borders, but pending that time there is much to be done by the Federal service.

The department has recognized that general conditions, as outlined, are of long standing, that they can not be remedied in a brief period, and that unwieldy appropriations, if made, could not be wisely expended in a single year; and so it is recommended that there be regular and reasonable annual increases, which will enable the department to readjust its personnel and activities.

MIDDLE RIO GRANDE CONSERVANCY DISTRICT

The Secretary of the Interior was authorized by Congress on March 13, 1928, to execute an agreement with the Middle Rio Grande conservancy district in New Mexico on behalf of the Pueblo Indians. The district, which is composed of white settlers in the Middle Rio Grande Valley, was formed under State law to provide irrigation, drainage, and flood control for approximately 132,000 acres of land. Interspersed with the district lands are 23,000 acres belonging to six Indian pueblos. These lands are not subject to the district law, nor to State and county taxation, the Indian being under the guardianship of the United States. However, for a comprehensive and economical development of the district, it was considered necessary to include the Indian lands, and Congress authorized the department to make a contract with the district providing for an equitable share in cost of construction.

The entire program is estimated to cost \$11,829,000. The act contemplates that the Government shall advance the Indians' share in a sum not to exceed \$1,593,311, to be repaid by cash from lessees, if and when received from such reclaimed Indian lands. About 8,346

acres of Indian lands included in the proposed development are now somewhat indifferently cultivated by the Indians under irrigation works. The water level is rising on this area, and unless drainage shall be provided considerable of the land ultimately will become water-logged and unfit for cultivation.

Some of the conditions to be incorporated in the agreement are specified by Congress. The Secretary is to determine the total acreage of the Indian lands that should bear a share of the cost. Only those lands susceptible of economical irrigation are to be taken into consideration. The average cost per acre to the Indians for the included lands can not exceed \$67.50. The Indians shall have free use of the present cultivated areas (8,346 acres) without payment of operation and maintenance charges and this acreage will be free from any lien created by the legislation. The Indians shall also have the privilege of using 4,000 acres of newly reclaimed lands without payment of rental charges, but these 4,000 acres are to bear their proportionate share of the operation and maintenance assessments. The remaining 12,000 acres of Indian lands are to be leased, the rentals therefrom being applied if and as collected to reimburse the Government for its advancements for and on account of the costs and benefits apportioned against the present cultivated area. The Indians are given a preference right to lease any part of the 12,000 acres, in which case they will be required to pay like rental as shall be paid by whites or others.

On August 6, 1928, a tentative agreement, prepared in the Department of the Interior, was signed by the officers of the Middle Rio Grande conservancy district and was returned to Washington for the signature of the Secretary of the Interior. As persons declaring themselves interested on behalf of the Indians requested to be heard respecting the agreement before it should be signed, a hearing was accorded them and officers of the district, by the Secretary of the Interior in Washington on September 19.

The agreement signed by the district, and concerning which the hearing was held, fixed a maximum charge to the Indian lands concerned of \$67.50 for any acre. Thereafter officers of the district, declaring that the purpose of the act is to provide that the average cost per acre shall be \$67.50, on October 12, notified the department that their previous execution of the agreement would be withdrawn,

unless its language should be interpreted or changed to state that the per acre charge on the Indian lands should be an average rather than a maximum of \$67.50.

In early October the Secretary of the Interior visited New Mexico and during two days personally inspected on foot and by automobile about 100 miles of the proposed district. He met with the elected governors and Indian councils of four of the six Indian pueblos affected by the proposed development. As many as 25 Indians attended some of these sessions. At all the conferences the proposed development was discussed. At Albuquerque hearings were given to those favoring and to those opposing the plans of the district. Accompanying the Secretary were three engineers, representing the Department of the Interior. Two of them have been in New Mexico studying the proposed development along the Rio Grande. Further action on the agreement has been withheld pending receipt of their report as to prospective benefits to be derived by the Indians, and the share of the cost which should be paid by their lands.

INDIAN CRAFTSMANSHIP

There are 355,901 Indians in the United States. They are numerous in 24 States. Last year they earned through the sale of their blankets, baskets, pottery, beads, wood carving, embroidery, and paintings, \$1,267,816. Of this sum 74 per cent, or \$944,863, was earned by the Indians of Arizona, Minnesota, and New Mexico. There is wide interest among our people in these activities of the Indians; for the preservation and encouragement of Indian arts and crafts; and in the purchase of the articles they make. In my visits to Indian reservations and schools in Arizona, New Mexico, and elsewhere I gave special attention to their handiwork. Perhaps the Government could recognize these products in some official manner and thereby render a real service to those Indians now engaged in such crafts and to those who might be encouraged to interest themselves in them. Field instructors from the Indian Service might enlist additional Indian producers.

The market for Indian handiwork at present is largely local, the bulk of the output being bought by tourists from dealers at the places of production. The demand for articles of Indian craftsmanship in distant parts of the country is negligible, probably because

potential buyers question the authenticity of the articles. In the Indian country the prospective buyer feels assured of genuineness, and the Indian setting provides an atmosphere which encourages him.

To enlarge the market for Indian handiwork, the department is considering the advisability of adopting a trade-mark design which could be registered in the United States Patent Office. The design would be attractive, suggesting craftsmanship of the North American Indian. It would be in a form suitable for attachment to the various articles to be marked. Use of the trade-mark would not be compulsory, but it would guarantee that the product was genuine.

A thorough distribution of the proposed trade-marks or labels could be accomplished by placing them with superintendents of Indian reservations and schools. Those officials would issue them with proper safeguards to insure their legitimate use. It would seem that some such plan need not interfere with established trade, and, with the co-operation of Indian traders and dealers generally, the distribution could be sufficiently wide that any Indian might readily obtain the trade-marks.

The department is mindful, too, of the benefits which might accrue to the Indians if some practical guaranty of the sanitary condition of such products were devised. The whole subject is receiving careful consideration.

THE PUEBLO LANDS BOARD

The Pueblo Lands Board, established by Congress in 1924, continued its investigation of the status of Pueblo Indian lands and water rights in New Mexico. The board consists of the Attorney General, the Secretary of the Interior, and an appointee of the President, the two former acting through assistants. The Secretary of the Interior inspected the offices and records of the board at Santa Fe, N. Mex., in October, 1928, advised with the members and visited some of the pueblos. It is the duty of the Attorney General to bring suits to quiet title based on the reports of the board. After court proceedings and appeals shall have been concluded, the Secretary of the Interior is to issue patents to successful claimants.

There are 20 pueblos within the scope of the investigations, each of them comprising from 13,000 to upward of 200,000 acres. The

board has completed the investigation of the pueblos of Taos, Picuris, Nambe, Tesuque, Santo Domingo, San Felipe, Santa Ana, Zia, Sandia, Isleta, and Jemez, and has filed its reports. In these 11 pueblos, 2,310 claims, affecting 26,165.6 acres, were considered and passed upon; 577 claims, affecting 18,579.47 acres, were rejected; and the remaining 1,733 claims were confirmed by the board in the claimants.

In the pueblos of Pecos and Pojaque no Indians remain, but the board will investigate and pass upon title to the lands within the areas. It is doubtful whether the pueblo of Zuni comes within the law, and few adverse claims exist in Laguna and Acoma. The investigations in these five pueblos therefore will be less complicated and onerous. The remaining four pueblos—San Juan, Santa Clara, San Ildefonso, and Cochiti—are distributed over an area of about 125 miles in length and 100 miles in width.

The work of the board involves hearings and investigations on each claim, the collection, translation, and abstracting of thousands of deeds, the examination of great numbers of witnesses, the study of extent, source, and character of Indian water rights and of adverse appropriations of Indian water by non-Indians. The board must consider the history and status of conflicting Spanish grants. It searches tax records in various county seats (which records are often incomplete and sometimes almost hopelessly confused). It appraises land values and estimates damages. It has many other collateral duties.

The amount of damage suffered by Indians for loss of lands and water through failure of the United States to prosecute rights of the United States or of the Indians, is also determined by the board, as is also the value of lands lost by settlers through adjudications of the board.

Congress has already made appropriations to cover losses on the Pueblos of Tesuque and Jemez, based on reports of the board, and recommendations will be made to the next Congress for appropriations to cover the awards on certain other pueblos. These funds are to be used under the direction of the Secretary of the Interior for rehabilitating the pueblos, for the purchase of land, and for the recovery of water.

There are but few of the Sandias left, and these are reported to be backward. The population of the other pueblos remains almost sta-

tionary. Some of them are distinctly progressive and energetic; others are apathetic and unable or unwilling to adapt themselves to present-day conditions. The Lagunas are undoubtedly the most prosperous and energetic of any of the Pueblo Indians. They are ambitious and enterprising, their people increasing in wealth, knowledge, and resources. The pueblos of Isleta, Sandia, Santo Domingo, San Felipe, and Cochiti have lands within the Middle Rio Grande conservancy project which proposes the irrigation and drainage of a large area on the Rio Grande in central New Mexico, as described elsewhere in this report. Upon the completion of the board's labors the status of all the pueblos should be greatly improved and the titles to the many valid claims within the pueblo areas will be cleared. The status of the various suits to that end has been reported to the Attorney General by his special assistant in Santa Fe. Generally, the courts have sustained the board's findings.

IRRIGATION OF INDIAN LANDS

A survey of the principal irrigation projects was ordered on January 19, 1927, by the Secretary of the Interior. The inspection was conducted by Porter J. Preston, engineer, Bureau of Reclamation, and Charles A. Engle, supervising engineer, Bureau of Indian Affairs. The economic condition of the projects was studied by Ray P. Teele, an agricultural economist detailed by the Secretary of Agriculture. Mr. Teele's work was terminated by death on August 31, 1927. The report, which was the first comprehensive study of the problems of irrigation on Indian lands, was filed on June 8, 1928, and has since been studied by the officers of the department.

Irrigation was first undertaken by the Federal Government on behalf of the Indians about 60 years ago. There are now about 150 irrigation projects on the various Indian reservations of the West. The projects vary in area from a few acres to as many as 183,000 acres. They comprise a total of 692,057 acres and have cost the Government in 60 years for construction and operation, \$35,967,925.72.

The report shows that only \$979,859.79, or 3.5 per cent, of the amount expended for construction of Indian irrigation works and which is reimbursable has been collected. In only a few instances where Indian land is leased are Indians being required to pay construction charges. In the report, it is estimated that the Government will ultimately sustain a loss

of about \$2,000,000 by reason of its inability to make collections on lands now in white ownership. The total collections on account of operation and maintenance of the Indian projects amounted on June 30, 1927, to \$2,638,311.33, or 29.9 per cent of the sum expended.

Approximately 70 per cent of the land susceptible of irrigation on Indian projects is in Indian ownership, the remaining 30 per cent being owned by whites. The report shows that only 362,018 acres, or 52 per cent, of the reclaimed area, are now being irrigated; that only 117,189 acres, or 32 per cent, are irrigated by Indians; and that the remaining 244,829 acres, or 68 per cent, are irrigated by either white owners or lessees. This means that only 16.9 per cent, or 117,189 acres of the total acreage on Indian projects for which water has been provided by the Government, is irrigated by Indians.

The report calls attention to the fact that on many of the so-called Indian projects most of the farming—in some cases practically all—is being done by whites, either as lessees or owners. For example, on the Wapato project, Yakima Reservation, the total acreage irrigated is 77,938, of which 4,661 acres, or 6 per cent, are irrigated by Indians; on the Blackfeet project with 7,149 acres susceptible of irrigation, only 44 acres, or about 0.6 of 1 per cent, are irrigated by Indians; on the Flathead Reservation the Indians are irrigating only 452 acres, or 1.3 per cent, of the 34,441 acres irrigated.

The Indians of the Uintah Reservation, of Utah, are doing more farming than are the Indians of any other reservation. They cultivate 15,243 acres. The Gila River, or Pima Reservation, of Arizona, is second with 12,000 acres farmed by Indians. It is interesting to note that 40 per cent of all Indian farming on projects covered by the report is on the Uintah and Pima Reservations. It is recited that on many projects the acreage utilized by Indians is continually decreasing, while the acreage utilized by whites is increasing.

Crops produced on irrigated lands farmed by Indians in 1927 had an estimated value of \$1,500,000, or an average crop value of \$21 per acre. On the same projects, the average crop value or return secured by white farmers was approximately \$40 per acre.

The report discloses that many Indians, particularly those on the northern projects, are securing insufficient returns from their irrigable land, some as low as \$6 per acre. Most of such land is not cultivated, and grows only wild hay. The maximum farm income of Indian

families on the more successful projects seldom exceeds \$300 each per year.

The ultimate irrigable area, is estimated at 1,450,021 acres, indicating that the projects now are only 48 per cent completed. To date, the average total irrigation cost per acre for the 692,057 acres is \$52. It is estimated that approximately \$29,000,000 additional will be required to complete the projects.

The report of the survey contains 75 general recommendations. Many of them will be made effective as rapidly as conditions permit. In proper cases, necessary legislation will be recommended to Congress.

The report shows that changes in economic and social conditions in the region surrounding Indian reservations have profoundly affected life on those reservations, and that many of the problems in Indian affairs are due to lack of adjustment to these changes. Increase in the white population surrounding reservations has advertised the irrigable Indian lands and the whites have increased their effort to own or control them. Desire to acquire these lands has been greater by reason of the building of railroads and paved highways, which bring the Indian lands closer to markets and make agriculture more profitable.

Costly irrigation works have been built under laws and policies that were based on the idea that the water would be used by Indians. It was thought that the Indian lacked aptitude and experience and that he might require a long, unprofitable apprenticeship, before he would become a skilled irrigation farmer; consequently provisions for use of water or for paying for works were liberally drawn. Such provisions were inadequate to meet abuses which might arise, if these lands and water supplies should pass into the control of the whites.

It has happened that on some of the reservations whites have demanded the same sort of contracts as were made for the Indians. Controversy and uncertainty have followed with consequent threatened loss to the Indians and to the Government. To adjust these controversies, it may be wise to increase the legal staff of the department. Then the rights and financial obligations of both Indians and whites may be determined.

AIRPLANES IN NATIONAL PARKS

While travel facilities in national parks during the 56 years of their existence have developed in as unusual ways as have means of transportation elsewhere, the management of the parks has been conservative in adopting new methods for viewing these natural wonders. Usually the wilderness character of the parks is one of their strongest appeals. The policy of the Park Service, therefore, has been to preserve the beauties of nature in their original form but at the same time to make the principal points of interest accessible to the millions who make their pilgrimages each year. Roads and trails, for example, are built to fit the scenery and to mar the landscape as little as possible. Hotels and camps where required for cafés and housing accommodations, generally can be made to harmonize with their surroundings.

About 70 per cent of the 3,000,000 annual park visitors use *private* automobiles, while the transcontinental railroads convey nearly all the others. It is a particular function of the National Park Service to provide within the parks, transportation facilities, hotels, and camps for the latter class. These are provided through concessionaires, who operate under Government contract and supervision. The free public camp grounds, established since the advent of the automobile, are operated by the National Park Service, the Government thus becoming the largest resort keeper in the country, and probably in the world. In these public camp grounds there are provided pure water, sanitary conveniences, electric light, camp stoves, and in some, laundries, shower baths, and other facilities. The Park Service is charged with the administration of the park areas, protection of park visitors, and supervision of services contracted by public operators.

The development of modes of travel in national parks has presented various problems. The tourist has viewed the parks progressively afoot, on horseback, from stage coaches, and from automobiles. Only 20 years ago the National Park Service was confronted with objections to the introduction into the parks of automobiles. The protests of nature lovers were overcome finally by the crowds who emphasized the inadequacy of the horse-drawn stage and coach. And now we find preserved as curiosities in some of the parks those "relics" of only a few years ago. Many park tourists still prefer to tramp or to ride saddle horses. Since many of the most beautiful areas are

accessible only in this way, there is a constantly growing use of the modern trails. But by far the greatest number of visitors travel through the parks in their own private automobiles or in motor busses over established routes.

The conservative attitude of the National Park Service is not based on a reluctance to discard the old and to adopt the new, but to a purpose to conduct millions of people through its domain safely and free from confusion and disturbance.

The modern airplane, with its increasing use as a means of passenger transportation, now presents a new problem. Its employment has been urged upon park officials for a number of years, but as yet no permits have been issued for landing fields within park boundaries, and flying over the parks has been discouraged. Admission of airplanes to national parks and regulation of their use, however, have been receiving the serious consideration of the department.

Manifestly the airplane will become an accepted means of transportation to and between national parks, if not in the parks. Their use then will make it necessary for the service to provide them facilities and to regulate them. The department has considered that the railroads, which in early times made the development of the parks possible, first should be heard in this connection. It has been proposed that they be permitted to build airports within the park lines near railroad terminals and to land passengers in the park at those airports, granting to private airplanes the use of such airports with a proper service charge.

On the other hand, it is urged that no encouragement should be given to the use of airplanes as sight-seeing conveyances, for the reason that it is impossible to obtain an accurate conception of the beauties and wonders of national parks by flying over them at safe altitudes. Others aver that only from the air can a view be obtained of generally inaccessible and most interesting places. There appears to be no general objection to the employment of airplanes between airports in the parks over routes to be established by the National Park Service and regulated by that service. It seems evident, too, that unless airports shall be provided within the parks, under park supervision, the service can not expect to control flying over these areas.

During the coming winter a conference of national park officials, officials of railroads having terminals at the national park bound-

aries, officials of transportation companies now operating within the parks, and of others, will be called for a full discussion and consideration of the situation, in an endeavor to formulate a definite and rational air policy.

RECLAMATION

There are 24 Federal reclamation projects, comprising 1,956,910 irrigable acres, which have been developed, at a cost of \$175,116,-945.41. The value of crops grown on land irrigated from Government works was \$133,207,210. These included lands irrigated by the canals built entirely by the bureau and canals supplied with water under Warren Act and other contracts.

Works now under construction involve a further ultimate expenditure of \$90,000,000. During the fiscal year progress was made in the construction of three large dams in California, Montana, and Utah, and contracts were awarded for the building of three other dams in Oregon, Idaho, and Washington, these projects all having been authorized by Congress and having been approved by the President and the then Secretary of the Interior. They are under the so-called 10-year program, announced in 1927, which provides for the construction of new projects authorized by Congress and the completion of old projects. Construction of these projects, new and old, exclusive of such proposed projects as the Colorado and Columbia River Basins, will absorb entirely the reclamation fund over a period of some years.

Under present regulations there is a board of examiners on each project where public land is still available for entry. These boards pass on qualifications of prospective settlers as to industry, experience, character, and capital. Eight public-land units were opened to entry during the year on the Tule Lake division of the Klamath project in Oregon-California and 28 on the Willwood division of the Shoshone project in Wyoming. Many of these units have been entered by qualified settlers. Options on a large number of farms in private ownership were obtained by the bureau on three projects. These farms are selling to settlers on amortized payments over a period of 20 years.

The Bureau of Reclamation has a revolving fund of about \$166,000,000 invested in reclamation projects. This investment is in the nature of long-term loans to settlers on the projects. The

settlers are obligated to refund to the Government the cost of construction and operation in annual installments extending over a period of years. As these payments replenish the revolving fund, they become available for developing new projects. Twenty-two of the Federal projects are now making regular repayments to the Government, and there are but two completed projects that have not yet reached a repayment status. The fund is also augmented by a portion of the money received by the Government from the sale of public lands, the accretion to the reclamation fund last year from this source amounting to \$705,822.66. Fifty-two and one-half per cent of all cash received by the Government as royalties from oil leases also goes into this fund and last year it was increased in the sum of \$2,454,168.66 from this source.

Following the general readjustment of financial relations between the Government and reclamation project settlers, based on the relief act approved May 25, 1926, the repayment of charges by settlers against project lands showed an increase of 25 per cent during the year. The repayment charges paid into the Treasury on this account amounted to \$5,299,149.55, as compared to \$4,260,221.35 for the previous year, a gain of \$1,038,928.20. The general prosperity on reclamation projects and the new terms of payment established for delinquents under the readjustment law are responsible for the increased return.

Of the 1,956,910 acres on the Federal irrigation projects there are 160,000 acres vacant and in need of settlers. There are 12,678 farms cultivated by tenants. Vacant farms and agitation by settlers for smaller yearly payments present serious problems for some projects. Few settlers have the capital required to convert a tract of raw land into a productive farm, the cost of improving, equipping, and operating farms having doubled in recent years. Hence, the bureau is seeking a better type of farmer with more capital and skill.

Modification of existing contracts to permit a longer period for repayment, or for a reduction of the indebtedness, is not encouraged.

It has been necessary for the department to control speculation in privately owned lands on proposed reclamation projects. To prevent fictitious and prohibitive inflation of values of needed lands the Bureau of Reclamation, prior to construction, has entered into contracts with owners of private lands to be included in the irrigation

district. These contracts have provided for an appraisal of the lands at their fair values, without reference to the proposed irrigation development. Under the reclamation laws water may be furnished to lands in private ownership not in excess of an area sufficient to support a family and to a maximum single ownership of 160 acres. Under the contract all areas held in a single ownership in excess of 160 acres must be sold to settlers at not more than the appraised value, which ranges from \$1 to \$20 per acre, depending on the topography and depth and character of the soil. If a landowner holding an excessive acreage has refused to sign such a contract it has been held that he was not entitled to receive water, although his land has been assessable for the project charges because of its inclusion in the irrigation district.

In March, 1928, the Secretary of the Interior ordered an examination to be made by competent engineers to determine the safety of all storage dams under the jurisdiction of the department on reclamation projects and Indian reservations. There are over 50 storage reservoirs under the control of the department, located at various points in the West, which are used principally for irrigated agriculture. They vary from small capacity to 2,638,000 acre-feet in the case of Elephant Butte Dam in New Mexico. The dams that would endanger human life if they were to break were examined first. Two consulting engineers were employed by the Bureau of Reclamation to collaborate with the regular engineering staff. The War Department assigned a number of Army engineers to assist. This examination is nearly completed. All the dams thus far examined have been reported as safe and presenting no menace to human life or property.

While farmers on reclamation projects have suffered from the conditions which have depressed agriculture generally, many of the projects have prospered greatly and have been a benefit to the entire country. Failure of some of them shows the need of further study of economic conditions and emphasizes the importance of local cooperation. The greater repayments during the last two years indicate that reclamation is being placed on a more businesslike basis and should become a still more effective agency in the conservation and use of our natural resources.

THE COLORADO RIVER

In connection with the discussion by Congress of the proposed Boulder Canyon dam, on the Colorado River, a joint resolution

passed by Congress and approved by the President on May 29, 1928, provides for the appointment of a board of engineers and geologists to examine the proposed site and to report its findings.

The resolution:

That the Secretary of the Interior is hereby authorized and directed to appoint a board of five eminent engineers and geologists, at least one of whom shall be an engineer officer of the Army on the active or retired list, to examine the proposed site of the dam to be constructed under the provisions of H. R. 5773, Seventieth Congress, first session, and review the plans and estimates made therefor, and to advise him prior to December 1, 1928, as to matters affecting the safety, the economic and engineering feasibility, and adequacy of the proposed structure and incidental works, the compensation of said board to be fixed by him for each, respectively, but not to exceed \$50 per day and necessary traveling expenses, including a per diem of not to exceed \$6, in lieu of subsistence, for each member of the board so employed for the time employed and actually engaged upon such work: *And provided further*, That the work of construction shall not be commenced until plans therefor are approved by said special board of engineers. No authority hereby conferred on the Secretary of the Interior shall be exercised without the President's sanction and approval. The expenses herein authorized shall be paid out of the reclamation fund established by the act of June 17, 1902.

Accordingly, with the approval of the President, the Secretary of the Interior on July 18, 1928, appointed the following engineers and geologists to comprise the Colorado River Board: Maj. Gen. William L. Sibert, engineer, United States Army, retired; D. W. Mead, engineer, Madison, Wis.; Robert Ridgway, engineer, New York; Charles P. Berkey, geologist, New York; and W. J. Mead, geologist, Madison, Wis.; all eminent in their professions, without connection with the area in question and without fixed opinions concerning it.

A preliminary meeting of the board was held in Washington on July 30, 1928, for the purpose of organization. The board selected General Sibert as its chairman and Mr. Berkey as secretary. The Secretary of the Interior emphasized his desire for an independent study of the subject. After a general discussion and an examination of the data available in the files of the department in Washington, the board adjourned to meet in Denver, Colo., on August 13, 1928, where the principal records and data to be considered were located. Pursuant thereto the board has been making its investigations and is expected to file its report in accordance with the terms of the said resolution. This report, when submitted, will be transmitted promptly to Congress. Except for furnishing such information and assistance as was requested by the board, the department has had no part in the survey.

POTASH EXPLORATIONS

The production of potash, an essential in American agriculture, chemical industries, and the arts, has long been under foreign control. The normal annual consumption of potash in this country has been about 250,000 tons, valued between \$15,000,000 and \$20,000,000. In 1927 our domestic producers sold salts with 49,500 tons of potash content, as contrasted with imports of 224,973 tons. Domestic production and sales represented only about 18 per cent of our national requirements.

Our Government took cognizance of our inadequate production of potash as early as 1910, and under congressional appropriations in 1911 the Departments of the Interior and Agriculture, through the Geological Survey and the Bureau of Soils, respectively, began coordinated but independent investigations covering a wide field of its possible sources.

Southeastern New Mexico and western Texas are underlain by extensive salt beds. Geologically this area is similar to the potash fields of Europe. In 1912 traces of potash in drilled wells were found in Texas. In 1915 the Department of the Interior, through the Geological Survey, undertook to drill the salt beds near Amarillo, Tex. The result was negative so far as potash was concerned, but since then the Geological Survey, partly in cooperation with the State of Texas, has had an observer in the Texas-New Mexico field to search for potash in oil-well drillings. Since 1920, with the extension of oil-well drilling, there have been frequent manifestations of potash minerals.

Congress recognized the importance of these discoveries by the passage of the potash act in 1926 and authorized an appropriation of \$100,000 annually for five years for investigations. The Departments of the Interior and Commerce were thereby authorized to conduct joint explorations by core drilling to determine the extent and character of potash deposits in the United States. By agreement between the departments, the Geological Survey, representing the Department of the Interior, selects the drilling sites, analyzes the core samples obtained, and publishes the results of the analyses. The Bureau of Mines, representing the Department of Commerce, negotiates the use of the selected drilling sites and carries on the actual drilling operations.

Eight core tests will have been made by the cooperating departments, three in New Mexico and five in Texas, by the end of the fiscal year 1928. All these tests have been developing the presence of potash-bearing minerals, and in at least three of the sites, one in New Mexico and two in Texas, the quality and thickness of the beds exposed by the core tests have been such as to give promise of commercial development. The Government's activities have also stimulated private explorations with gratifying results.

The progress thus far made in potash explorations gives a growing assurance of the possibility of ultimate independence of foreign producers.

FEDERAL OIL CONSERVATION BOARD

The Federal Oil Conservation Board, appointed by President Coolidge on December 19, 1924, is composed of the Secretaries of War, Navy, Interior, and Commerce.

The activities of the board are more closely connected with the Department of the Interior, however, than with the other departments represented, and the Secretary of the Interior continued as its chairman. As President Coolidge set forth when he appointed the board, "The administration of oil resources is a practical question with the Department of the Interior." The Government is possibly the largest lessor of oil land. The second report issued in January, 1928, discussed possible substitutes for petroleum and also recorded a gratifying and increased interest in oil and gas conservation. Indorsement has also been given to the work of the board by the technical and trade press, the purpose of the board to prevent waste of most valuable and necessary products having become known.

The board created the committee of nine, a representative group of lawyers and oil men. The First Assistant Secretary of the Interior was a Government member and served as the committee's vice chairman. This committee's report was made to the board in January, 1928, and recommends both Federal and State legislation to legalize agreements for cooperative development and operation of single oil pools and to permit curtailment of production in times of surplus supply. The report also indorses earlier recommendations by the board itself that the Secretary of the Interior should have certain discretionary powers in administering public and Indian oil lands so as to promote practical conservation.

With the purpose of stimulating interest in these important matters by the State law-making bodies, the chairman of the Federal Oil Conservation Board has brought the committee's report to the attention of the governors of all the oil-producing States.

The cooperation urged upon the industry has become an active working force and practical conservation of this valuable resource is being attained through cooperation of Federal and State officials with the executives of oil companies.

Conservation in its broadest sense, however, is not yet an accomplished fact. Much remains to be done, both by the Federal and State Governments if our natural petroleum resources are to be conserved.

NEGRO EDUCATION

• One of the more important activities of the department has been a comprehensive study of negro colleges and universities throughout the United States. This study was conducted by the Bureau of Education. Its purpose was to ascertain the present status of negro higher education and to recommend means for its improvement and development.

The results show marked progress and an extraordinary demand among the negro people of the country for college and university education. Of the 79 institutions included in the bureau's survey, 77 were doing college work as compared with 31 institutions 10 years ago. The enrollment of negro students in those institutions totaled 13,860 as compared with 2,132 in 1917, a gain of 550 per cent. For every 10,000 negroes in the United States 15 are attending college, as against 90 for every 10,000 whites.

With five exceptions, the colleges included in the study were located in Southern States, indicating a widespread sentiment in the South in favor of negro higher education. Twenty-two of the institutions were operated by States and supported through public taxation. The bureau's study also shows that the negroes, themselves, have not been remiss in providing higher education, 17 of their colleges being owned, administered, and financed entirely by members of their race.

The curricula in these 77 universities and colleges include, among others, courses in law, medicine, engineering, pharmacy, and

dentistry. In the publicly supported colleges operated by the States the work largely centers in teacher training, agriculture, home economics, and mechanic arts education. The bureau's study shows that 963 negro youths were graduated last year with undergraduate degrees while 211 were graduated with the higher degrees.

The quest for higher education is not confined to young men of the race. The report shows that negro girls are attending colleges in almost the same proportion as men. In the institutions surveyed that reported enrollment of students by sex there were 5,944 negro girls enrolled as compared with 6,146 men, the proportion being 49 per cent girls and 51 per cent men. Most of the girls attending negro colleges are training themselves to become teachers. Others are enrolled in home economics courses. Several of the institutions have also established training schools of nursing. In the institutions studied by the bureau were three women's colleges, devoted exclusively to the higher education of negro girls. There were also four colleges attended by men only, the remainder being coeducational.

The capital value of the investments in these negro schools was fixed at \$15,720,000, including land, buildings, and equipment. Ten years ago the total productive endowment of negro colleges amounted to \$7,225,000, with an annual yield of \$361,250, while last year the productive endowments aggregated \$20,715,000, with an annual yield of \$1,071,300, almost a fourfold increase in 10 years. Yet the bureau found a shortage in the number of teachers. It criticizes, too, their quality.

Most of the States have established land-grant colleges offering courses to the negro in agriculture, mechanic arts, and crafts, and the survey discloses his increasing interest and efficiency in them. It declares the need, too, of more trained professional and technical leaders of the race, including doctors, dentists, lawyers, and preachers.

The negro population numbers 11,600,000, representing 9 per cent of the total population of the United States. In the World War 368,000 negroes answered the call to the flag, and about 200,000 served in the American Expeditionary Forces in France. Evidently the physical and intellectual welfare of so large a proportion of the population is of first importance not only to the 9 per cent, but to the 91 per cent also.

CONSERVATION OF NATURAL RESOURCES

The Department of the Interior might well have been named the department of western development. From the date of its organization, nearly 80 years ago, this unit in the executive branch of the Government has had as the objects of its major activities the public lands and the Indians. As the decades have passed the frontiers of departmental administration have been pushed ever westward until now Point Barrow on the Arctic, and the western shore of the island of Kaula, at the crossroads of the Pacific, are widely separated points on the far-flung limits of its jurisdiction. In all these 80 years this executive department has been preeminently the friend of the pioneer.

The date of the creation of the Department of the Interior—1849—itself suggests western discovery, western exploration, western settlement, and western development. The preceding half century had been the period of land acquisition by the young Nation. In all this subsequent winning of the West the activities carried on under the Secretary of the Interior have constantly expanded in scope and become more varied in character. Administrative policy has had its vicissitudes in this long period, but we can trace a general trend in policy and an uninterrupted growth in influence that reflect in turn the westward progress of national development. The exploitation of the western country for its fur and gold was the purpose back of the explorations by the earlier pathfinders, but the fur traders and the gold miners were closely followed by the cattlemen and the homesteaders—a veritable army of occupation—home seekers more than fortune seekers.

In this period western settlement was necessarily guided by the explorers and surveyors sent out by the Department of the Interior, with the prime purpose of helping a pioneering people settle a vacant land. The transformation of raw lands into homes was wrought upon an empire-building scale, for the real-estate operations of this department involved the disposal of hundreds of millions of fertile acres to a million and a third of home seekers. Thus the western plains became the world's granary, and the mineral lands once in public ownership contributed to their private and corporate owners a goodly part of the world's output of metals.

Even with all the seemingly lavish distribution of land under the homestead and other laws, as well as the land grants in aid of railroad and military wagon-road construction, the general purpose of which was settlement, the Federal Government remained a landowner on a very large scale, and into the business of handling this extensive estate new ideas found their way and a new land policy was gradually evolved. Fact finding, largely conducted by the Department of the Interior, had brought home to the public more and more of an appreciation of the value of the public lands, even of that remnant left after the best of the timber, coal, and farm lands had been acquired by private citizens and corporations. The policy of short cuts to settlement by wholesale grants and retail homesteads and mineral claims slowly gave place to a more thoughtful attitude as the limits to the public lands came to be realized. In this development of a new public-land policy the officials of the Department of the Interior had a leading part; they logically became the active advisers of congressional committees seeking to express the new ideas in new laws.

The new business policy for administering the national domain began to take shape about 20 years ago, but its evolution continues. Its keynote has been to put to the best possible use whatever remains in public ownership—wise utilization of land, whether agricultural or mineral, grazing or irrigable, forest or power site. Such a policy predicates scientific land classification. Just as thoroughgoing inventory of the land and its resources is the first step in managing a landed estate, this inventory-making has been an outstanding function of the Department of the Interior as the administrator of the national domain.

Parallel with the new policy in promoting the best use of the public land has been the application of the same economic principles to the management of the Indian lands, of which the Secretary of the Interior stands before the law as the trustee.

The control of the national forests has been lodged with the Department of Agriculture, but the establishment of the national forest policy was based upon the pioneer work of the Department of the Interior in exploring, classifying, and selecting the lands to be set aside for forest purposes. Similarly, the present reclamation policy had its origin in fact-finding irrigation surveys, authorized 40 years ago. And the laws providing for leasing lands that are chiefly

valuable for the mining of coal, oil, gas, phosphate, or potash or the generating of water power likewise recognize scientific classification of the Nation's lands as an integral part of public land administration. At its start, half a century ago, the land classification was necessarily of the nature of a general and qualitative survey of the national domain, but the Interior Department engineers have been putting their investigations on a more and more detailed and exact basis, until now they seek to afford a quantitative determination of every natural resource that gives value to the publicly owned lands. Only with the facts at hand as to the relative worth and possible use of these lands is it possible to administer properly the land laws of to-day and to propose more advanced laws for to-morrow.

One of the department's activities of interest to the farming and livestock industries is the mapping and classification of agricultural lands. As a by-product of the examination of lands applied for under the enlarged and stock-raising homestead acts, areal classification maps of 290,000,000 acres of land on the eastern slope of the Rocky Mountains and in the Great Plains have been published in preliminary form for the benefit and use of the Department of Agriculture and of ranchers in the West. The maps show the areas of irrigated land, of first, second, and third grade, land suitable for dry-farming operations, land suitable only for grazing, and other special classes, and indicate what type of agricultural operations can be expected to be successful. Similar mapping west of the Rockies is in progress.

Foremost among the present-day activities of the Government in planning for the future is its handling of the resources that represent the energy supply. A national inventory of tons of coal, barrels of oil, and second-feet of water is a measure of the potential aid that will be ready for American workers of the future. With the present realization that the limit to be placed upon industrial progress is likely to be fixed by the amount of power available for doing man's work, it is a plain duty to safeguard the future with a business-like policy in developing these stores of oil and coal and in utilizing these power sites.

The people's interest in water resources is served only through use, and the proper utilization of the great irrigation reservoirs and the thousands of power sites on the public domain has been for many years the definite object of much of the activity of the Interior Depart-

ment engineers. The part that these water-power resources may have in future social progress is suggested by the estimate that the undeveloped power sites in the public-land States have an aggregate capacity of 15,000,000 horsepower. Incidental to the continuing work of land classification in its broad sense, 23,000 miles of river surveys in the public domain remain to be made by Interior Department engineers.

The adoption by Congress of the leasing system, for the public oil and coal and other mineral lands, necessitated special business procedure in the administration of a great mineral estate. The extent of this estate is not even yet adequately known; but it may be stated approximately as including 30,000,000 acres of coal lands that contain more than 200,000,000,000 tons of valuable coal, half a million acres of phosphate land that can supply 8,000,000,000 tons of this essential fertilizer as its need on American farms is better realized, an undetermined acreage of potash deposits, the best of which yet discovered are on public lands, 65 developed oil and gas fields with an annual production of 33,000,000 barrels of oil, and 4,000,000 acres of oil shale from which possibly 60,000,000,000 barrels of oil can be extracted when high prices arrive to warrant the higher cost.

In the management of this vast estate by the Interior Department the supervision of the 543 oil and gas leases together with the 22,000 prospecting permits is the largest item and the one requiring the highest degree of technical and legal attention. Yet the more slowly growing demand for coal mines on the public domain forecasts an even more important factor in western development. Probably it is the Nation's generous endowment of coal reserves that furnishes the greatest assurance of her future prosperity, and so it is more than a matter of passing interest that the estimated quantity of coal in Government ownership here in the western United States exceeds the total tonnage of all coal in the British Isles as estimated by Britain's most eminent authority.

The very responsible interest of the Interior Department in power-site reserves measures the duties of the Secretary of the Interior as a member of the Federal Power Commission and as the official having exclusive jurisdiction over earlier permits to power companies that generate more than 10 per cent of the public-utility power supply of the country. In connection with their continuing study of the best

methods of utilizing the water resources of the country, the engineers of the department collect and publish the monthly statistics of power generation.

Federal supervision of mining operations on Government leases is strict. Although the specific duty of the officials in Washington and the engineers in the field is to enforce the terms of each lease, to see that the proper royalties are collected, and that the public interest is served, they also in large measure act in helpful cooperation with the lessees. A Federal mining engineer who by his practical knowledge assists a private operator to attain a greater production at a smaller cost benefits not only that operator but the general public, and when he helps to bring about safer working conditions for the miners he performs genuine service to humanity. When by advice against improper methods he prevents waste of the publicly owned deposits of coal, oil, or gas, he safeguards not only the public in its ownership but also the private operators in their investments.

GENERAL LAND OFFICE

There remain approximately 194,000,000 acres of unappropriated public lands in the United States, exclusive of the Territory of Alaska. This acreage is equal to the combined area of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, Delaware, Virginia, West Virginia, and North Carolina.

In a large proportion of the patents heretofore issued the minerals have been reserved to the United States to be administered as demand arises. Mineral rights retained by the Government in entries patented under the stock raising law, which provides for reservation of all minerals, amount to 18,882,000 acres. Rights to specific minerals have been retained in 11,750,000 acres. In addition to the vacant unappropriated public lands and the reserved mineral deposits, approximately 135,000,000 acres in Federal ownership within the exterior limits of the national forests are subject to all the provisions of the mining laws, the mineral leasing act, and several other public land laws.

RECEIPTS AND EXPENDITURES

The low price of oil throughout the fiscal year, not only discouraged production, but necessarily resulted in diminished receipts for the quantity actually produced. The income from other sources compared favorably with that received in recent years.

The total cash receipts from sales, leases, and other disposition of public lands (including receipts from copies of records, sales of Government property, etc.), were \$6,194,767.01, and from sales and leases of Indian lands, \$515,687.83, an aggregate of \$6,710,454.84, all of which was deposited in the Treasury, to be distributed as follows: General fund, \$1,290,895.09; public land States, \$1,845,742.48; Indian tribes, \$461,854.29; reclamation fund, \$3,111,962.98.

Total expenditures for the conduct of the business of the General Land Office, including expenses of the district land offices for salaries and commissions of registers and incidental expenses (\$278,543.82) amounted to \$2,190,197.57. Disbursements from the following deposits, trust funds, and reimbursable appropriations are not included in the above figures, either as receipts or expenditures: From deposits by individuals for surveying public lands, \$21,478.53; from completing surveys within railroad land grants, \$3,407.77; from opening Indian reservations (reimbursable), \$253.28; from surveying

and allotting Indian reservations (reimbursable), \$18,831.76; from surveying and allotting Northern Cheyenne Reservation, Mont., \$17,530.55; and from miscellaneous Indian appropriations and funds, \$5,791.99.

FIELD INSPECTION

The appropriation for this service for the year 1928 was \$430,000. An average force of 72 inspectors was employed, exclusive of 7 division inspectors in direct charge of the field work. The cost of maintaining division offices, with necessary clerical assistance, was also paid from this appropriation.

The total amount of cash collected and turned in to the Treasury during the year as a result of the work of this force was \$38,054.33. Of this amount \$26,926.05 was in settlement of trespass cases; \$5,026.40 secured through timber sales, and \$6,101.88 recovered through civil and criminal action brought by the Department of Justice in cases of depredations on public lands and other violations of the public land laws. Lands restored to the public domain as a result of investigations by inspectors, representing fraudulent entries, etc., canceled through proceedings based on their reports amounted to 153,139.29 acres. Inspectors investigated and reported on 17,657 cases, of which 5,333 were reported adversely and 12,324 favorably. There were held 333 hearings in Government contests. Civil suits in 64 cases were recommended to the Department of Justice for court action as a result of investigations. Of the 87 suits tried, 67 were won and 20 lost. As a result of successful prosecutions the sum of \$6,101.88 was recovered and 5,395.28 acres restored to the public domain. There were 21 indictments returned for offenses against the public land laws. Of the criminal cases tried 11 resulted in convictions, under which there were 7 prison sentences and fines of \$2,050 were imposed. Payments of fines, based on previous convictions, amounted to \$2,800.

The use in the field of Government-owned cars for which a larger appropriation than theretofore was made available during the year, resulted in material savings. Such cars traveled a total of 542,436 miles at an average operating expense of \$0.0594 a mile, including depreciation. Hired cars covered 74,086 miles and cost \$0.128 per mile.

The appropriation for protecting public lands, timber, etc., for 1928, provided an allotment of \$25,000 for prevention and fighting of forest and other fires on the public lands. The total expense incurred was \$18,475.24.

SURVEYS

The organization plan of the cadastral engineering service remains unchanged. Field operating, cartographic drafting, and record offices are maintained at Helena, Mont.; Cheyenne, Wyo.; Denver, Colo.;

Santa Fe, N. Mex.; Phoenix, Ariz.; San Francisco, Calif.; Reno, Nev.; Salt Lake City, Utah; Boise, Idaho; Olympia, Wash.; Portland, Oreg.; Juneau, Alaska, and at Washington, D. C., where action preliminary to survey initiation and acceptance is taken. There is also maintained at Denver a headquarters office under the supervisor of surveys, who exercises general supervision over the execution of the public land surveys, under the direction of the Commissioner of the General Land Office.

Appropriations for surveys and resurveys for the fiscal year 1928 carried in the Department of the Interior act approved January 12, 1927, included surveying public lands, \$800,000. In addition \$20,000 of the appropriation surveying and allotting Indian reservations (reimbursable), 1928, and \$17,000 of the appropriation surveys, allotments, etc., Northern Cheyenne Reservation, Mont., 1928-29, and \$500 of the appropriation general expenses, Indian Service, 1928, were transferred by the Office of Indian Affairs to this office for surveys and resurveys. Other funds available and expended during the year for public land surveys included \$6,800 from surveying within land grants (reimbursable); \$5,000 from Coolidge Dam across Canyon of Gila River near San Carlos, Ariz. (reimbursable), 1928-29, and the following special deposits: Deposits by individuals, R. S. 2401, \$362.78; act of September 21, 1918, \$1,541.76; act of February 27, 1889, \$69.33; act of March 3, 1909, \$244.79. There was also expended from deposits by individuals (R. S. 2334) for office work in connection with mineral surveys, \$19,135; in all, \$870,653.66.

The wider uses made of the public lands to-day through settlement by private enterprise under the mineral leasing act, and by the Government in scientific investigation and research work, call for cadastral surveys to meet the requirements of title, lease, location, and administration.

Original surveys and resurveys under the rectangular system were executed in 22 public land States and the Territory of Alaska under 257 groups, 109 of which, in 20 States, were of resurveys. So much of this work as may still be gauged on a mileage basis aggregated during the year, 19,317 linear miles, which were surveyed at an average cost of \$20.87 per mile.

Miscellaneous surveys included 89 field investigations, largely of erroneous and fictitious survey conditions, in Arizona, California, Colorado, Nevada, New Mexico, Oregon, Washington, Wyoming, and in eight States east of the Mississippi River; investigation of the Cimarron Base Line, Oklahoma; the location of section boundaries for the State highway commission, Montana; and corrective surveys of faulty older surveys in Montana and New Mexico. Surveys to determine riparian conditions resulting from accretions and avulsions, to define swamp and overflow lands, and to return

lands erroneously omitted at the time of the original survey, were made in New Mexico, Oregon, Louisiana, Wisconsin, Minnesota, and Arkansas. Also under this head surveys related to but not essentially a part of the rectangular system include 57 islands in Alaska, California, Idaho, Wyoming, Louisiana, Illinois, Mississippi, Wisconsin, Minnesota, and Florida; seven town sites in Alaska including forest eliminations from the towns of Wrangell, Ketchikan, Cordova, and Juneau, as well as 16 lighthouse reservations, 16 isolated homesteads, 2 cemetery sites, and the Fort Liscum Military Reservation. This diversified class also embraces 14 mineral segregation surveys, distributed throughout the western States.

Original surveys of lands deemed valuable for oil were continued throughout the year in eastern and southeastern Utah, and initiated during June in western Wyoming, while the resurveys of oil shale areas in western Colorado were steadily carried forward with a view to completing all authorized projects of this character at an early date.

Surveys and resurveys for and in cooperation with other governmental agencies are steadily increasing in volume and broadening in scope. Upon application by the Forest Service surveys were executed in all western States and in Alaska, Florida, and Michigan. For the National Park Service surveys in and of a part of the boundaries of the Glacier National Park, Mont., and resurveys in the Rocky Mountain National Park, Colo., were continued, while the survey of boundaries of the Grand Canyon National Park, Ariz., was initiated. Surveys to identify coal leasing units in Utah and resurveys for oil leasing units along the east boundary of the Navajo Treaty Reservation, N. Mex., were made for the Bureau of Mines. Field investigations for the Federal Power Commission were carried on in California, and the rectangular net in the Great Salt Lake Basin, Utah, was extended in cooperation with the Geological Survey.

Surveys on Indian reservations were made under various appropriations in Montana, Arizona, California, Oklahoma, Nebraska, South Dakota, Wyoming, New Mexico, Utah, and Minnesota.

Surveys and resurveys in 251 townships were platted and approved. There were also 28 forest homestead entry surveys approved at an average cost of \$10.81, 277 supplemental and segregation plats constructed, exclusive of 132 supplemental plats accompanying survey returns; and 275 mineral surveys, embracing 937 locations, platted at an average cost of \$18.38 each. The sum of \$4,377.05 was earned during the year by the public survey offices in the Western States, exclusive of Alaska, through the furnishing of copies of records, and covered into the Treasury as miscellaneous receipts.

There were accepted and placed on file plats representing 1,571,917 acres of original surveys of public lands, and in addition, 1,365,771

acres of lands resurveyed, comprising an aggregate area of 2,937,688 acres.

MAPS

The map of the United States, edition of 1927, has been printed and is now ready for distribution. The State maps of New Mexico and Michigan have been printed and issued. The map of Minnesota has been revised, and that of the north half of California has been compiled and both are now in the hands of the contractor for printing. The map of the United States west of the Mississippi River showing the activities of the Department of the Interior has been recompiled, and the maps of the Territories of Hawaii and Alaska, were revised and will be printed later. An enlargement of the wall map of the United States on a scale of 21 miles to an inch is being prepared for the international exposition at Seville, Spain, also a delineation of the routes of the early Spanish explorers.

There were sold 17,752 photolithographic copies of township plats, for which \$8,959 was received, and 7,896 copies were furnished other departments for official use. There were distributed 169,138 circulars covering the various public land laws and the regulations thereunder, 2,572 maps mounted, and 3,815 State maps distributed.

PUBLIC LAND ENTRIES AND WITHDRAWALS

The total area of public and Indian lands on which original entry was made and allowed was 3,726,421 acres, as compared with 3,594,838 acres the previous year. Patents were issued covering 2,477,867 acres.

The homestead division considered 39,300 items under the homestead and related acts. Patents were issued on 8,760 homestead entries, involving 1,927,869 acres. Action was also taken upon 1,573 applications to make second homestead entry, 671 applications to amend, 744 applications for extension of time to establish residence and for leaves of absence, and upon 18,870 appeals from the action of district land officers. Timber and stone applications were received to the number of 494, and 206 entries of that nature were approved for patenting.

Five new stock driveways were created under section 10 of the act of December 29, 1916 (39 Stat. 862), and 29 were modified after investigations. The gross area withdrawn for such purposes was 29,962 acres, and that released from such withdrawal, 7,031 acres. The area included in driveway withdrawals at the close of the fiscal year was 9,208,453 acres.

Action was taken on 33 town sites and 3,200 town-lot entries. Two town sites and 688 lot purchases were passed to patent. Efforts to adjust titles in the old town of Pensacola, Fla., under recent

legislation, resulted in the requirement of additional proofs in a number of cases and the issuance of patents on 47 applications. Sales were held of lots in the town sites of Hot Springs, N. Mex., and Lonepine, Mont. A resurvey was made of St. Marks, Fla., and lands at Jupiter, Fla., were subdivided into town lots. The records in 2,429 contested cases were received and 2,278 were adjudicated.

Two hundred and ten railroad right-of-way applications were received and considered; also 486 irrigation, electrical transmission, and miscellaneous right-of-way applications. Twenty-two suits to secure forfeiture of rights of way were recommended and 27 decrees of forfeiture obtained as a result of previous recommendations; 54 suits are still pending.

As a result of applications theretofore made for restoration from power site withdrawals and classifications 62 restorations in accordance with the terms and conditions of section 24 of the Federal water power act were promulgated. This class of work has been steadily increasing since the passage of the act in 1920.

Ninety-three hydroelectric power project applications have been transmitted here by the Federal Power Commission, involving public lands and lands within national forests in 12 States and the District of Alaska.

There were received 1,891 filings and entries for lands in Federal reclamation projects. Of these cases, together with 255 on hand at the beginning of the year, 1,865 received action.

Since the passage of the act of August 11, 1916 (39 Stat. 506), applications by 35 State irrigation districts for approval under its provisions have reached the General Land Office. Of these, three applications, embracing approximately 38,504.57 acres, were received during the past fiscal year. Action was taken on five cases.

There have been in all 38 contracts containing designations under the act of May 15, 1922 (42 Stat. 541), of lands situated in 32 irrigation districts, embracing an area of 1,070,380.77 acres. This makes a total of 53 districts approved under the two acts.

Twenty-two original reports and 15 supplemental reports were received as the result of investigations of private irrigation enterprises and State irrigation districts upon which claimants and applicants under the desert land law depend for their water supply, making a total of 1,388 such projects reported on since the adoption of the regulations of September 30, 1910 (30 L. D. 253-261). There were also received from the Geological Survey nine reports bearing upon the water supply and feasibility of projects in connection with which investigations had been made. Fifty-six irrigation companies and districts were considered during the year.

Two thousand eight hundred and ninety-two cases under the desert land laws were received, which, together with 484 brought over, totaled

3,376 and were disposed of as follows: Approved, 719; canceled, 608; requirements made, 1,161; otherwise disposed of, 382.

Withdrawals, segregations, and patent applications under the Carey Act, embracing 1,893,997.55 acres of either public or segregated lands, were considered. Interlocutory or final action was taken upon 1,771,-681.16 acres, leaving 122,316.39 acres awaiting decision. Of the amount disposed of 639.33 acres theretofore segregated were patented; 128,387.04 acres were canceled, and the remainder received interlocutory actions. The total area now segregated and unpatented is 766,732.08 acres.

Pittman Act applications and permits were disposed of as follows: 84 approved; 57 canceled; requirements made, 65; and 4 otherwise disposed of. Twelve patents were issued on Pittman Act entries, and several final proofs submitted are in the field for investigation.

Twenty-two drainage entries under the Minnesota and Arkansas drainage acts were disposed of.

The swamp land work continues to be heavy. New applications aggregating 138,352.80 acres and 103,084.75 acres in connection with which requirements had been made, were received, which, together with 58,992.77 acres pending, totaled 300,430.32 acres before the office for action. Of this amount, 46,069.76 acres were approved and patented, 65,543 acres finally canceled, requirements made with respect to 83,076.14 acres, and 1,350.90 acres otherwise disposed of, leaving 104,390.14 acres awaiting office action.

Public lands to the extent of 938,829 acres were placed in a state of reservation, either by Executive or departmental order, under various applicable acts, for the purposes set forth in the various orders, and 776,573 acres theretofore reserved were restored to entry or other proper disposition.

PUBLIC LAND IN ALASKA

The enactment of the law with reference to the leasing of lands in Alaska for fur farming (act of July 3, 1926, 44 Stat. 821), has aroused the interest of a great many people in the States who desire to use the public lands for such purpose. At present a homestead entryman may use his land for fur farming, provided he otherwise complies with the homestead law. Such use of the land alone, however, is not regarded as sufficient compliance with the law as to settlement and cultivation to entitle the homesteader to a patent. There is some demand for extension of the act of July 3, 1926, to the public land States.

On January 30, 1928, circular No. 1108 was amended so that leases may cover an entire island, where the island contains not to exceed 30 square miles. Where the area of an island is greater than 30 square miles, leases are not allowed in excess of 640 acres. Where

the islands are so close together that animals can cross from one island to the other, more than one island may be included in a single lease.

Action was taken on 63 cases involving the issuance of leases under said act of July 3, 1926, and three leases, two for 640 acres each and one for an island, were issued. Action was taken on 39 applications to purchase 5-acre tracts in Alaska under the act of March 3, 1927 (44 Stat. 1364), and on 25 trade and manufacturing entries under the act of May 4, 1898 (30 Stat. 419).

SCHOOL SECTIONS

Selections of indemnity school lands were received amounting to 101,881.01 acres and 194.59 acres of lands under grants in quantity for specific purposes, total 102,075.60 acres. There were conveyed to the States 52,589.20 acres of indemnity school lands and 884.13 acres of quantity grant lands while 22,007.09 acres of indemnity school-land selections and 158.95 acres of quantity grant selections were rejected and canceled, making a total of 75,639.37 acres finally adjudicated.

Title to 4,642.55 acres of land was conveyed to the State of Washington under cooperative agreement providing for the exchange of school-section lands within the boundaries of national forests for other lands within such boundaries. In all, there have been conveyed to the States pursuant to such agreements an aggregate of 655,673.72 acres.

The act of January 25, 1927, granting mineral school sections to the various States has materially increased the work of the General Land Office, in that it is now incumbent upon that office to determine whether the various school sections pass to the States under the original granting acts as nonmineral land, or under the provisions of said act of 1927 as mineral lands.

On the first day of the year the office had before it for consideration the status of 648 school sections. Cases involving 922 school sections were received. The titles to 880 school sections were finally adjudicated. In 209 cases further showing was required and 481 cases were awaiting examination on the last day of the year.

The 880 adjudications involved 112,077.65 acres found to have passed to the State under the original granting act, 38,529.47 acres found to have passed under the act of July 25, 1927, and 39,966.43 acres found to have passed to the State, but in which the act was not specified.

RAILROAD GRANTS AND SELECTIONS

Railroad and wagon-road listings and selections were received to the extent of 117,672.77 acres; 85,729.79 acres were certified or patented in satisfaction of such grants; 44,840 acres of selections were rejected, the total acreage adjudicated being 130,569.79 acres.

Public resolution approved June 5, 1924 (43 Stat. 461), created a joint congressional committee empowered and directed to make a thorough and complete investigation of the land grants of the Northern Pacific Railroad Co. and the facts and the laws pertaining thereto. House joint resolution of May 28, 1928, suspended action on the grant by the department until June 30, 1929.

The work of adjusting the following 11 railroad land grants was completed: Central Pacific; California & Oregon; Cairo & Fulton; Little Rock & Memphis; Tennessee & Coosa; Alabama & Chattanooga; South & North Alabama; Selma, Rome & Dalton; Marquette; Houghton & Ontonagon; Chicago & North Western; and Florida Central & Peninsular Railroad Cos.

Two of these adjustments, the Central Pacific and the California & Oregon were approved and the others are awaiting action by the beneficiaries, either by way of acceptance or protest, before being submitted for approval.

Three other adjustments are progressing rapidly, viz, Cedar Rapids & Missouri River; Flint & Pere Marquette; and Amboy, Lansing & Traverse Bay Railroad Cos.

The work necessitated a careful tract book, survey plat, and grant plat examination of each smallest legal subdivision in 21,765,818.43 acres of granted and indemnity land, and the transfer thereof and of the former and present status of each smallest legal subdivision to the adjustment sheets. In effect this work means the complete reexamination of every transaction heretofore made in connection with each grant with regard to then existing law or as since changed by legislation and decisions of the department and the courts.

REVESTED OREGON AND CALIFORNIA RAILROAD AND COOS BAY WAGON ROAD GRANT LANDS

Six tracts embracing 235.94 acres of revested lands, situated within what is now the Roseburg land district, were restored to homestead entry. An area of 1,062,000 acres of such lands had heretofore been restored, which with the 235.94 acres make a total of 1,062,235.94 acres that have been restored to entry.

Under the act of June 9, 1916 (39 Stat. 218), 59 sales of timber on Oregon & California Railroad lands were made, involving 7,311.49 acres of land, containing 261,585,000 feet board measure of timber, for which the sum of \$490,445 was received. Total sales

to date, 545; area, 81,545.13 acres, containing 1,666,255,000 feet board measure of timber. Total receipts, \$4,581,338.42.

Under the acts of June 9, 1916 (39 Stat. 218), and February 26, 1919 (40 Stat. 1179), five sales of timber on Coos Bay lands were made, involving 42,560,000 feet board measure of timber on 740 acres, for which the sum of \$82,460 was received. Total sales to date, 74; acres involved, 13,340.61 acres, containing 472,427,000 feet board measure of timber; total receipts, \$1,169,747.54.

There were examined and audited claims of certain counties in Oregon for amounts in lieu of taxes on revested Oregon & California Railroad grant lands under the act of July 13, 1926 (44 Stat. 915), as follows: For the years 1916 to 1925, inclusive, allowed for \$325,516.23 and rejected for \$172,297.36; for the year 1926 various claims were allowed for \$585,461.46, and rejected for \$26,884.03. Eleven claims in the total amount of \$435,082.55 for the year 1927 were received, of which seven were allowed for \$281,382, and rejected for \$151.66. The other four claims were received too late for audit during the fiscal year.

MINERAL

There were 143 oil and gas cases on hand involving leases and relief applications under sections 14, 18, 18a, 19 and 22 of the act of February 25, 1920 (41 Stat. 437). During the year 731 applications were considered, 2 permits and 40 leases being granted. Under section 14 of the leasing act which authorizes leases to permittees who show a discovery of oil or gas as a result of prospecting under a permit, 36 leases were issued covering an aggregate of 18,528.94 acres. Under section 17 of the leasing act authorizing the public sale of leases two leases were issued in the Kern River Oil Field, Calif., and one in the Alkali Butte Field, Wyo., aggregating 479.45 acres, on which bonuses were paid amounting to \$672,500. However, under sections 13 and 20 of the act 3,876 new applications were received and 53,121 cases for reconsideration. Permits were granted on 4,402 applications. Final action in whole or in part was taken on 4,088 cases; 927 assignments were acted upon, and 5,158 applications for extensions of time were disposed of, all except the first mentioned showing a very marked increase over last year. Three thousand seven hundred and thirty-nine permits were held for cancellation, and 7,970 permits were canceled in whole or in part; 26,274 cases were examined on which further action was necessary, leaving 4,439 cases awaiting consideration at the close of the year, of which 2,371 were pending reports from the Geological Survey.

There were in hand 93 mineral entries and 1,367 were received; 1,397 were disposed of, leaving 63 awaiting action. Of those disposed of 350 were approved for patent.

Two coal entries were approved for patent, covering 357.18 acres based on rights initiated under coal land laws prior to the enactment of the leasing act February 25, 1920. Eighty-five potash permits were issued under the act of October 2, 1917, covering an aggregate of 157,307.83 acres. Under the act of February 25, 1920, 14 sodium permits were issued covering an aggregate of 21,421 acres.

There were in hand at the beginning of the year, 160 applications for coal permits, leases, and licenses; 2,191 applications were received; 83 coal prospecting permits issued covering an aggregate of 100,468.63 acres; 37 coal leases covering an aggregate of 9,126.05 acres; 8 coal licenses covering an aggregate of 320 acres. The total number of cases disposed of during the year was 2,193, leaving 158 cases in hand. The area included in coal prospecting permits during the year increased by 4,160 acres.

Three coal permits aggregating 5,315.66 acres were issued in Alaska.

There were in hand 27 miscellaneous mineral cases, and there were received 1,649 cases; of this number 1,601 were disposed of, leaving in hand 75 cases.

On July 1, 1927, 65 mineral applications were pending; 421 applications were received, and 466 were disposed of, leaving 20 mineral applications in hand at the close of the year.

Receipts of the Federal Government from bonuses, rentals, and royalties under the law providing for the leasing of mineral rights on the public domain aggregated \$4,677,277.16. The largest receipts were obtained from leasing mineral lands in Wyoming, the amount being \$2,940,091. The second State in the amount of receipts was California with \$1,389,800.40. Receipts from other States follow: Montana, \$119,070.36; Colorado, \$96,789.01; Utah, \$58,081.38; North Dakota, \$32,740.14; New Mexico, \$25,835.27; Washington, \$3,976.86; Louisiana, \$3,871.18; Alabama, \$3,036.10; Idaho, \$2,482.41; Nevada, \$1,463.05; South Dakota, \$40. Pursuant to the mineral leasing law, each State receives $37\frac{1}{2}$ per cent of the receipts from bonuses, rentals, and royalties derived from public lands within its borders, the reclamation fund receives $52\frac{1}{2}$ per cent, and the other 10 per cent is paid into the Treasury of the United States and credited to miscellaneous receipts.

INDIAN MATTERS

On February 1, 1928, the department approved a revision of the regulations of April 15, 1918 (46 L. D. 344), governing Indian allotments on the public domain under section 4, act of February 8, 1887 (24 Stat. 388), and amendments thereto.

Action was taken on 3,705 applications for fee and trust patents. Trust patents issued on 1,261 allotments embracing 202,963.52 acres; fee patents issued on 1,352 allotments, for 173,606.44 acres, and in addition patent issued on 6 Indian homestead entries for 360 acres.

Homestead entrymen and purchasers of lands within the former Cheyenne River and Standing Rock lands, to the number of 2,844, were notified of the payments required pursuant to the act of March 31, 1928 (45 Stat. 400). Action was taken on 5,531 cases involving entries and purchases of ceded Indian lands. The action related principally to requirements as to payments. A large number of these entries was for Fort Peck lands, Mont.

The several acts of Congress empowering certain Indian tribes to sue in the Court of Claims for moneys alleged to be due them for treaty lands required the expenditure of a very considerable amount of labor and research in ascertaining the acreages of the tracts involved, and the manner of disposition and the amounts received therefor. Some cases embrace a large portion of the area of several States. Several such claims, involving large acreages of land and large sums of money, are now pending for answer to questions by the Department of Justice or Court of Claims.

MISCELLANEOUS

There were considered 108 cases involving old Spanish and other private land grants, and 114 small holding claims, 253 cases involving lands in abandoned military reservations, 632 soldiers' additional applications, 135 scrip rights, 85 preemption and 118 old credit and cash entries, 19 military bounty land warrant locations, and 1,408 proposed exchanges of privately owned land for Government land or timber. Accounts were stated in 254 repayment cases and 124 such claims were denied. Twenty-nine entrymen for Mud Lake Bottom lands, Minn., were allowed \$34,850.58 pursuant to the act of May 3, 1928 (45 Stat., Part 2, 34). Minnesota Chippewa Indian timber to the extent of 886,890 feet was cut under contracts entered into under the act of June 27, 1902 (32 Stat. 400).

One national forest was created by exclusion from an existing forest, three were enlarged, and 15 reduced under the act of June 4, 1897 (30 Stat. 34). Two national forests were reduced and 16 enlarged under special acts of Congress and 9 forests established under section 9 of the act of June 7, 1924 (43 Stat. 653), were abolished. There are now 151 national forests embracing within their exterior boundaries 184,403,819 acres, of which slightly over 86 per cent is public land.

AVIATION FIELDS

The increased interest in aviation during the past two years has caused a demand for suitable aviation fields and airports. Leases therefor were made to a number of cities and towns under special laws.

The act of May 24, 1928 (Public, 499), which was introduced at the suggestion of this department, provides a general law for leasing public lands for aviation purposes. Such areas are each

limited to 640 acres of contiguous land. The law provides for an annual rental for a period of 20 years, subject to renewal for like periods.

All departments and agencies of the United States operating aircraft are to have free and unrestricted use of the airports. If necessary for military purposes, the Government may assume full control of them. Permission may also be granted to establish beacon lights on public lands, and the Secretary of the Interior may withdraw public lands, other than terminal airports, for use as beacon sites or other air navigation facilities.

Prior to the approval of the act of May 24, 1928, public lands were subject to withdrawal by the President for public purposes, and the authority of the President to make such withdrawals is in no manner restricted by such act. Where, therefore, unappropriated public lands are desired by the Department of Commerce or other Federal agencies for aviation purposes, requests for their withdrawal may be submitted to the Secretary of the Interior for consideration by the President.

STOCK GRAZING ON THE PUBLIC DOMAIN

Instructions were issued January 7, 1928, Circular No. 1138, for the leasing of land in Alaska for grazing livestock in pursuance of the provisions of the act of March 4, 1927 (44 Stat. 1452). Three grazing districts were temporarily established in accordance with said act, effective June 30, 1928, to coincide with the three public land districts of Alaska.

March 29, 1928 (Public, No. 210), Congress passed an act authorizing cooperative agreements with the State of Montana and private owners of lands within certain limits in the State of Montana, whereby such privately owned lands and lands within the same area belonging to the United States may be jointly leased for a period of not to exceed 10 years to stockmen owning land within or adjacent to the said area. This measure applies to 108,804 acres of rough grazing land in Montana of which the United States own 27,534 acres.

PROPOSED LEGISLATION

Nothing has developed during the fiscal year demanding any radical or major change in our public-land system, although the wisdom of previous efforts to secure general legislation for the regulation of stock grazing has been more fully demonstrated.

The distribution or the economic and equitable use of our arid and semiarid public lands is a problem the solution of which requires our best thought and endeavor. The 320-acre entry law, or, as it is sometimes called, the dry farming act, and the stock raising homestead law, allowing 640-acre homestead entries, have proven of value, but the areas where dry farming may be successfully conducted and

the lands which in parcels of 640 acres will support a family have been largely reduced. The stock raising homestead acts, with their present limitations, do not meet the conditions of to-day. Through sufferance our public lands have become in theory a grazing common, but through the lack of supervision in many instances they are not available to all on equal terms. Furthermore, lack of control has resulted in over use—destructive of the forage growths. And yet enormous investments in flocks and herds have been made in faith of an open range, and any proposed legislation must take into consideration conditions as they actually exist.

There are among the range users three widely divergent schools of thought; first, those who prefer the present system and who oppose any form of restriction, and likewise oppose any liberalization of existing law looking to disposal of the lands by the Government; second, those opposing organized control but favoring a measure that will permit of the disposition of the lands under the homestead laws in parcels of 1,280 acres or more; third, those advocating strict governmental supervision, with the recognition of present users under a leasing system and the repeal of the stock raising homestead law. The department has inclined to regulation through leasehold, with proper restrictions and safeguards for the present users, and has repeatedly recommended the enactment of a law authorizing such control. If Congress will not enact such a measure then the department suggests an amendment of the stock raising homestead law so as to permit of the acquisition of parcels of 1,280 acres under its provisions. If a law permitting regulation through lease be passed, the stock raising homestead act should be repealed; otherwise the stock raising homestead act should be so amended as to be responsive to our present needs.

Many of the measures recommended in the report of last year were enacted during the first session of our present Congress. The urgent need of a law authorizing the disposition of withdrawn lands and areas omitted from former surveys as water covered, but since ascertained to be arable, in the State of Florida, will be met by the enactment of H. R. 11281, in the form it passed the House of Representatives. The Secretary will be authorized to afford equitable relief in certain claims held under color of title if S. 3776, which has passed the Senate, becomes a law. These measures should pass.

For the reasons stated in the report for 1927 it is recommended that provision be made for the disposition of the withdrawn areas in Florida, Alabama, Mississippi, Michigan, and Wisconsin; that the act of July 5, 1884, be so amended as to include other abandoned Government reservations, and that authority be given for an additional volume of the work "Public Domain," so as to bring it down to date.

BUREAU OF INDIAN AFFAIRS

HEALTH

The general medical work of the Indian Bureau was continued through the year with good results. The difficulties incident to the administration of this service as outlined in the Secretary's annual report of the fiscal year 1927 continue to obtain to a greater or less degree. Many years will be required before the necessary improvements can be carried out to place this service on a more efficient basis, to reduce the turnover of medical and nursing personnel, still unduly high, and to create other factors which will provide a well balanced and equalized medical and surgical service for the Indian wards of the Government.

Trachoma, tuberculosis, and the diseases of infancy and childhood continue to be the outstanding health problems of this race.

It is felt that progress is being made, particularly in trachoma control, through the establishment of trachoma and nontrachoma schools and the closer delineation of the trachoma activities of the special physicians.

The following additional hospitals were constructed during the year and opened at the beginning of the new year: At the Albuquerque School, N. Mex., with 60 beds; Chin Lee, Ariz., and Tohatchi, N. Mex., schools with 15 beds each; Taos Pueblo, N. Mex., with 12 beds; and Havasupai Hospital, Ariz., with 6 beds. The new hospital at Choctaw Agency, Miss., was opened during April, with 25 beds, and nearly 100 patients were admitted up to June 30. A 36-bed general hospital was opened at the Western Navajo Agency, Ariz. Plans were also made for the conversion of the Kayenta Boarding School within the Western Navajo Reservation into a sanatorium with 40 beds for tuberculosis and 10 for general patients.

Authority was received during the past year for the installation of X-ray machines and other laboratory facilities in our general and tuberculosis hospitals. Increased facilities are being provided in our general hospitals for the treatment of advanced cases of tuberculosis not suitable for or unwilling to receive treatment in the established sanatoria.

The nursing service, which was increased considerably during the year, 21 hospital nurses having been added to the staff, will require additional numerical strength before being placed on anything like an adequate basis. The steps already taken will tend considerably toward reduction of the high turn-over in this personnel.

The public-health nursing work is being better organized, and it is felt that the quality of this service is showing considerable improvement. Twelve new positions of this nature have been established.

During the year there has been an unusually high incidence of both measles and influenza, particularly with reference to the Indian population of the Southwest. This, both directly and indirectly, is a factor of considerable importance in the lighting up of old cases of tuberculosis and in increasing the susceptibility of the younger population. The effects of an undue prevalence of these two diseases will influence tuberculosis cases for many years.

From data thus far received indications point to a decrease in the number of cases of trachoma found during this fiscal year as compared to prior years. The factors having to do with a determination of the actual number of cases of tuberculosis are so many and so complicated that no accurate statement can be made regarding the increase or decrease of this disease.

The services of the medical and nursing personnel on the whole have been loyal and efficient. There is still at most reservations an inadequate number of both medical and nursing personnel and the physical facilities at most places are yet below accepted standards. A general improvement along these lines is apparent. In addition there has been a carefully prepared plan of expansion of present hospital facilities. On the whole, good service has been performed.

Considerable difficulty has been experienced in providing a sufficient water supply free from contamination at some places and the Public Health Service was called upon to investigate and report what methods are required to correct same. The Institute for Government Research also called attention to the need for improvement of the water supply at some jurisdictions. A consulting engineer has been added to our corps of employees for the purpose of making a survey of the water and sewer systems at every jurisdiction in the service and to make such recommendations as may be necessary to insure an ample supply of pure water and sanitary sewerage disposal.

EDUCATION

For the fiscal year 1927 there was given a comparative statement showing enrollment of Indian pupils in Federal boarding and day schools by grades and there is appended a statement extending the comparison to include the year 1928. It will be noted that while the number of beginners is 250 less than in 1925-26, there is an average increase in the number in higher grades demonstrating an advance in their studies accomplished by a considerable number of pupils and a gradual trend toward an education higher than elementary.

The following table shows a comparison by grades of the enrollment of Indians in Government schools for three school years:

	1926	1927	1928		1926	1927	1928
Beginners.....	3, 288	3, 015	3, 038	Grade VIII.....	1, 130	1, 379	1, 589
Grade I.....	3, 070	3, 150	3, 103	Grade IX.....	792	994	1, 239
Grade II.....	2, 963	3, 256	3, 129	Grade X.....	492	586	662
Grade III.....	3, 167	3, 134	3, 246	Grade XI.....	232	380	458
Grade IV.....	3, 211	3, 207	3, 106	Grade XII.....	159	212	289
Grade V.....	2, 635	2, 895	3, 102	Special ¹		107	193
Grade VI.....	2, 133	2, 469	2, 663				
Grade VII.....	1, 629	1, 928	1, 901		24, 901	26, 712	27, 718

¹ Special includes pupils in sanatorium schools, pupils in ungraded classes, and a few attending secondary schools or junior college.

Later reports, embodied in Table No. 3, in the appendix to this report, will show a slightly different total for 1928.

Indian schools owned and conducted by the Federal Government were inaugurated in 1870, pursuant to an appropriation by Congress of \$100,000. The growth of the boarding and day schools has been gradual since that date, culminating at the present time in 77 boarding schools and 129 day schools, which have a total capacity for accommodation of approximately 26,000 pupils. Of the boarding schools 58 are situated within Indian reservations for the children of the tribe or tribes domiciled there, and 19 of the number are termed nonreservation schools because they are not within a reservation, but at other conveniently selected places and receive children from any or all tribes within the approximate geographical district of the school. It has been found necessary from time to time to discontinue day schools because of changing tributary school population, but on the other hand new boarding schools have been established or others enlarged within the past few years in furtherance of a policy to eventually provide educational facilities for all Indian children, deducting, of course, from the total number of eligible children those who can to advantage attend State public schools and about 5,000 who attend mission schools operated by several religious denominations. Of eligible Indian children from 6 to 18 years of age, inclusive, there are approximately 78,000, the number being more definitely shown by statistical Table No. 2.

Education of Indians in State public schools has been promoted and has rapidly increased since the year 1900, through the efforts of the bureau facilitated by congressional appropriations for payment of tuition to the public schools. There were during the year about 35,000 Indians in the public schools. This policy is believed expedient from all points of view and it may be anticipated that many children not now attending will be placed in the public schools within the next two or three years.

Existing law (act of February 21, 1925, 43 Stat. L. 958) permits the expenditure of only \$300 per pupil per year for schools having an average attendance of less than 200, and \$270 for schools with an attendance of 200 or more. Annual appropriations, however, have

been less than these limitations. For the fiscal year the appropriations for boarding schools allowed expenditures at a rate of \$225 per capita, with exceptions in cases of five small schools for which \$250 was appropriated. The current expenditures by the schools were necessarily curtailed in order to avoid incurrence of deficits, and while the stringency of funds was felt in many other respects, its effect upon the supply of adequate food for pupils was more especially evident. Increases in salaries under reclassified compensation scales have added materially to cost of operation and while the increases provided by the act of May 28, 1928 (the Welch Act), were not in effect, yet for the ensuing year these will total \$322,531. It is generally admitted that the economies which Federal Indian schools have been compelled to practice have been harmful, and more adequate funds will have to be provided if Indian education is to advance.

Extension of the platoon system of class organization to many of the larger boarding schools has been delayed until teachers, space, and facilities could be secured. However, the additional instructors necessary have been secured for a considerable number of schools and it is now possible to progress with the development of the plan. During the year attendance of pupils of the first three grades during both forenoon and afternoon class sessions was accomplished in many more schools pursuant to instructions issued to such effect.

Under prior existing law 30 days' educational leave has been allowed to instructors in Indian schools in order that their service might be rendered more efficient by attendance at college or normal summer courses for teachers. As these courses are not less than of six weeks' duration, the time allowed was insufficient and credits could not be earned by the teachers. A change in the law was secured, as provided by the act of May 8, 1928, authorizing 60 days' educational leave in every alternate year for both teachers and physicians.

INDUSTRIAL ACTIVITIES

Reports from the field indicate that there has been a steady increase in the acreage cultivated by the Indians. It is the purpose of the bureau to encourage efficient cultivation of a moderate-sized tract rather than to urge seeding indiscriminately without regard to quantity or quality of crops. There is not insistence that all Indians take up farming or stock raising. Where it is evident that they are not fitted for these industries or have no inclination therefor, they are encouraged and assisted in finding other employment. This is especially true of many of the younger generation who have a fair English education, together with industrial training, and hence can readily find remunerative employment.

Despite the many drawbacks to farming, such as floods, late springs, and early frosts in the mountains, and droughts and hot winds in

the South and Middle West, the Indian farmers and stockmen manage to fare about as well as the average white man under similar circumstances. The superintendent of one reservation in Montana reports that although all sorts of setbacks were encountered last year, the Indians raised 51,780 pounds of garden vegetables, such as carrots, beets, onions, rutabagas, turnips, and cabbages.

One of the main objectives of the industrial program for the Indians is to have each family own and properly care for a milch cow. One instance of success in so doing was at the Colorado River Agency, in Arizona. The superintendent there selected six families and sold cows to them on the reimbursable plan. Five of the six families are producing all the milk they can use and making some butter and cottage cheese, thereby reducing their food bills materially.

The superintendent of the San Carlos Agency, Ariz., reports that last year 3,117 calves were branded for individual Indians, or a calf crop of about 55 per cent, as compared with 797 calves in 1923, when the industrial program was inaugurated.

The sheep industry was started two years ago at Fort Berthold, N. Dak., by providing 20 head for each of 7 families. In the spring of 1928 there were 19 families with sheep, some having as many as 90 head. Where this number was found the original sale was increased by a second sale on the part of the superintendent, or the Indian bought a few more head on the market. The natural increase averages about 30 head per family. The superintendent has been collecting for the Indian owners on these sheep \$1.50 per head from each wool clip and \$1 from the sale of each wether lamb. Accordingly, the Indians are gradually reducing their debt and increasing the fund for the conduct of their business.

The livestock industry throughout the country generally is again on a substantial basis, and the Indians have benefited materially through the higher prices received for their stock as the result of improved conditions. The returns which they received from the sheep industry have been particularly gratifying, and due to that fact the Indians are taking a very active interest in selecting and developing their flocks.

Satisfactory progress has been made during the year toward the removal and disposition of worthless horses on the various reservations. One concern reports that it has purchased 117,000 such horses in North and South Dakota, Wyoming, and eastern Montana. Reports indicate that from 6,000 to 8,000 horses have been sold from other reservations during the year. Arrangements have been made to dip all horses on the Blackfeet Reservation, which has been under quarantine for several years due to the presence of scab, and such horses as the Indians wish to dispose of will be purchased by the company mentioned.

An additional appropriation of \$20,000 was made by Congress to continue the dourine eradication work on the Navajo reservations. It is believed that the intensive campaign carried on during the past two years will result in the complete eradication of the disease. An active interest is being taken in the sheep industry by Indians on reservations where it has not been carried on before. This indicates that they are beginning to appreciate the advantage of that industry as a means of support.

IMPROVED HOMES

The bureau is giving special attention to the bettering of home conditions throughout the service. Believing that substantial houses, well ventilated and constructed, with due regard to sanitary requirements, are the best preventives against disease and the highest incentive to good morals and industrial advancement, the superintendents have been instructed to lend their best efforts to induce the Indians to use every possible available resource in the building of good homes, suitable to their means and needs.

A special campaign for better homes in the Navajo country, in Arizona and New Mexico, has aroused great interest among these independent and nomadic Indians. By the judicious use of reimbursable funds, augmented by their own efforts and the utilization of native building materials, the Navajos are building a considerable number of good homes. While the movement is only in its infancy, the interest shown is so great that it may be confidently predicted that the next five years will show a rapid change from the present dirt hogan to a class of homes of which the Navajos may well be proud.

On the Fort Hall Reservation in Idaho, using funds derived from the sale of the bottom lands covered by the American Falls Reservoir, over 100 houses have been built on the allotted lands. A large number of these people heretofore lived under very primitive conditions, but they are now taking pride in their new homes and the outlook is very promising for better health and better living generally. With a comfortable home, the Indian, like everyone else, finds it much easier to work and improve his economic condition.

The Indians of the Kiowa, Comanche, and Apache Reservations have made an unusual record in home building, having progressed so far that, taken generally throughout the territory occupied by them, their houses and outbuildings are equal to if not better than the average among the white people of the community. This splendid showing has been made possible by two factors: The fertility of the lands allotted to the Indians and the willingness of the Indians to so use their lands or dispose of surplus lands as to make it possible to finance the home building. In the campaign for better houses,

the superintendent in charge made a survey of the assets of each family and pointed out to the members of the family the ways and means to be used, and in almost every instance the family has been quick to follow his advice.

Many other specific instances might be cited to show the awakening interest of the Indians in better homes. The movement is growing, and the results already obtained give encouragement for further effort.

ASSISTANCE OF OLD OR INDIGENT INDIANS

The year witnessed a new use of the reimbursable fund. The appropriation act for the year, making available \$175,000 for the purpose of encouraging industry and self-support among Indians, now provides that loans can be made to old, disabled, or indigent Indian allottees for their support, to remain a charge and lien against their lands until paid. This provision makes it possible to aid such Indians as formerly were dependent on friends and relatives or ration issues. It is now possible to advance funds for their support in an amount not to exceed 50 per cent of the appraised value of their lands. There were 63 applications of this kind approved during the past year, involving a total amount of \$11,950.

INDIAN EMPLOYMENT

The major number of requests for employment that come to the office from Indians are for positions in the Federal service. In the field superintendents act as labor agents and secure work for the Indians of their respective jurisdictions. At Blackfeet and other northwestern agencies there was considerable activity in putting Indians to work. At San Carlos a resident labor agent has induced all of the Indians of the vicinity to go to work and is extending his efforts now to adjacent reservations.

Indians having allotments with water available are achieving success in farming and stock raising, as their industry warrants. Within some reservations Indians have built and furnished modern homes, which are well kept and sometimes rival those of their white neighbors, this being brought about by the Indians finding employment regularly. In estimating the income of Indians, those who have established homes away from reservations must be included.

A considerable number of Indian boys and girls upon leaving school by graduation or otherwise find employment away from their homes in various occupations and render service creditable to themselves. Obviously the main purpose of the education which the Government is at pains to afford is to prepare them for and assist them to enter into such occupations as may serve to establish them in a future position of independence and self-support. Assistance in the matter

of placing an Indian boy or girl in the most suitable occupation and environment is an essential factor of the entire problem of Indian civilization. Assistance heretofore has been given by superintendents of schools and reservation employees to a limited extent but has not been systematized nor sufficiently organized and developed.

It would be highly important could this work be developed and sufficient moneys be appropriated for employment of a small but efficient personnel to conduct the work. This is a phase of Indian administration which especially calls for remedial action. The Indian graduate entering upon his life work is deprived of the assistance which in the case of the young white man or woman is rendered by parents or friends.

LAW AND ORDER

Legislation is needed to apply the laws of civilization to Indians on reservations. Many offensive acts are committed by Indians of which the courts can not take cognizance because the laws prohibiting such offenses do not apply to them. Indians at present are in a somewhat anomalous position. Congress has conferred Federal citizenship upon all Indians born within the territorial limits of the United States, and by virtue thereof it is claimed that they have the right of suffrage in the elections of their State. On the other hand the State laws have not been extended to Indians and consequently the State can not prosecute this class of its "citizens" for violations of the law. Legislation to correct this condition has heretofore been urged.

For the suppression of the liquor traffic among Indians, \$22,000 was appropriated, but additional funds are needed. Considerable help and cooperation have been received from the Federal Prohibition Bureau and from many State officers, but the peculiar problems of this work as related to Indians call for a larger and more thoroughly organized force than can be secured with the present appropriation.

PERSONNEL

During the year there has been material improvement in the personnel of the field service, and the passage of the act of May 28, 1928, called the Welch Act, affording increases in compensation effective July 1, 1928, should assist during the ensuing year in retaining and securing more contented and efficient employees. Arrangement was completed whereby Indians will qualify under the usual civil-service requirements which apply to white applicants, a certain preference percentage being allowed to them for appointment in the Indian Service. This plan will also open to Indians opportunities for employment in other branches of the Government service.

A plan has also been adopted permitting extension of the probationary period of appointment to better meet the special needs of our service.

TRIBAL ENROLLMENT

Mention was made in the report for the preceding year of the preparation of a final roll of the Eastern Band of Cherokee Indians in North Carolina pursuant to the act of June 4, 1924 (43 Stat. L. 376). The work was continued during the current year under direction of the enrolling commissioner and his report thereon is expected early in the fall.

The act of June 3, 1926 (44 Stat. L. 690), provides for a "complete roll" of the Northern Cheyenne Indians, in order that they may receive individual allotments within the Northern Cheyenne Reservation, Mont. The roll was approved by the department June 21, 1927, but mention was not made of the matter in the report for 1927.

ALLOTMENTS

During the fiscal year ended June 30, 1928, 1,067 allotments were made to individual Indians embracing lands on various reservations, aggregating 101,234.42 acres, as shown in the following table:

Reservation	Number of allotments	Acreage	Reservation	Number of allotments	Acreage
Colorado River, Ariz.	55	550.00	Crow, Mont.	326	52,285.84
Fort Yuma, Calif.	1	10.00	Fort Berthold, N. Dak.	4	680.00
Augustine, Calif.	4	162.37	Kiowa, Okla.	1	160.00
Cabazon, Calif.	12	483.90	Klamath, Oreg.	5	792.79
Torres-Martinez, Calif.	9	360.00	Umatilla, Oreg.	1	80.00
Mission Creek, Calif.	16	157.41	Pine Ridge, S. Dak.	1	640.00
La Jolla, Calif.	77	743.02	Quinalt, Wash.	551	43,706.03
White Earth, Minn.	3	408.65			
Fort Peck, Mont.	1	14.41		1,067	101,234.42

In addition to the foregoing, 91 allotments were made to Indians residing on the public domain in various States, embracing 12,916.42 acres.

EXTENSION OF TRUST PERIOD

The period of trust was extended by order of the President on allotments made to Indians of the following named tribes and bands: Nez Perce, Idaho; Prairie Band of Pottawatomie, Kans.; Devils Lake Sioux, N. Dak.; Tonkawa (Oakland Reservation), Okla.; and Pawnee, Okla. The period of trust was also extended on lands patented to 16 different bands of Mission Indians in California.

CALIFORNIA INDIANS

One tract of land containing about 38 acres was purchased at a cost of \$5,000 for the use of about 150 homeless Indians located near the town of Wilton, Sacramento County, Calif. The location of this land affords the Indians school facilities and opportunities for employment. Negotiations are pending for the purchase of a small

tract containing about five acres on the Fort Independence Reservation, Inyo County, Calif., to provide home sites for three Indian families. Up to the present time approximately \$203,000 has been expended for the purchase of about 9,350 acres for homeless Indians in California.

CHOCTAW INDIANS OF MISSISSIPPI

Three separate purchases have been made, covering a total of 170 acres, which have been resold to four Choctaws of the full blood under the reimbursable plan for a total consideration of \$2,950. These tracts will afford home sites for about 20 persons. One purchase is pending for a tract of 40 acres at a cost of \$500 for the benefit of a family of five persons. To this time \$38,412 has been expended for the purchase of lands in Mississippi covering a total of 1,323 acres for resale to 44 Mississippi Choctaws of the full blood under the reimbursable plan.

ADDITIONAL LANDS FOR INDIAN USE

During the first session of the Seventieth Congress legislation was enacted providing for withdrawal from entry or other disposition under the public land laws of approximately 91,000 acres of public land for the use of Indians in several States, including about 14,000 acres for the Acoma Pueblo Indians in New Mexico, about 69,000 for the Walker River Indians in Nevada, and about 7,000 acres for the Umatilla Indians in Oregon.

ADDITIONAL LANDS FOR NAVAJO INDIANS

Pursuant to authority contained in the second deficiency act for 1928, approved May 29, 1928, \$200,000 was made available for expenditure during the fiscal years 1928 and 1929, for the purchase of land and water rights for Navajo Indians residing on the public domain in Arizona and New Mexico. The item provides for a total expenditure of not to exceed \$1,200,000 from funds belonging to the Navajo Tribe representing proceeds from the leasing of tribal oil lands. The total income from this source for the fiscal year 1927 was approximately \$346,000, and for the first quarter of 1928 it was approximately \$52,000. The estimated income for the fiscal year 1929 is \$260,000.

The tribal representatives have expressed themselves as in favor of the use of tribal funds in the purchase of additional land for those members of the tribe living on the public domain and numbering about 6,000. The livelihood of the Navajo Indian is largely dependent upon the raising of sheep and cattle. It is therefore necessary for them to have under their ownership or control sufficient land with which to pursue their principal industry and source of support.

When all necessary information has been received and considered, steps will be taken to purchase such tracts in the various jurisdictions as may be found suitable and within the limits of the amount authorized.

SALE OF INDIAN LANDS AND FEE PATENTS

During the year cash sales and deferred-payment sales were made of 417 tracts of original Indian allotments aggregating 49,731 acres and sales of inherited Indian lands comprising 851 tracts and totaling 101,682 acres. The total consideration received was \$2,321,860. Both the acreage sold and the amount received were somewhat greater than during the prior year.

By act of March 3, 1928, the sales act of June 25, 1910, was so amended as to permit retention of interest on deferred-payment notes in addition to the original payment of 25 per cent for the benefit of the Indian grantor, in cases where the sales are canceled because of default in final payment by the purchaser. This will have a favorable effect in insuring prompt payment of notes.

Patents in fee were issued to 242 applicants and heirs of allottees, covering 22,618 acres, and of the applications received 40 per cent were approved. Fifty-three certificates of competency and removal of restriction orders were approved, releasing 4,336 acres from Government supervision. Within many of the reservations much of the best agricultural land has already been sold or patented, and it is the policy to discourage sales except in cases where held by old or indigent Indians who are in need of money for support, and in cases of inherited lands where the heirs are so numerous that the lands can not be advantageously partitioned. When the heirs are less numerous (four or less) and the inherited tracts are susceptible of a fair and equal division, it is the policy to encourage partition of the property so that the younger Indians, many of whom did not receive allotments, may have farming lands and home sites which they may be thus encouraged to remain on and improve.

During the year a circular letter was sent to all superintendents requesting them to submit a list of all Indians under their respective jurisdictions to whom patents in fee were issued prior to 1921, during the trust period and without application therefor. The purpose is to afford relief if possible, through legislation or otherwise, to those whose lands were lost through lack of business efficiency or through taxation. Suits in the name of the United States are now pending to determine the question as to exemption from local taxation, of lands theretofore taxable, which were conveyed to Indians with restriction against alienation or incumbrance, except with approval of the Secretary of the Interior, such lands having been purchased for homes and paid for with their trust funds. Also there is pending a suit to set aside sales of lands of the Eastern Band of Cherokee

Indians of North Carolina for unpaid assessments for 1926, in which case the defendants assert the unconstitutionality of the act of June 4, 1924 (43 Stat. L. 376, 381), which provides that such lands shall be exempt from taxation after the expiration of the taxable year following the date of the act cited under which the restrictions were removed.

Some tracts have been set apart for mission purposes, with the consent of the Indians interested. The areas have usually been small. A few fee patents have been issued to mission organizations for sites that have been in use for not less than six years. In most cases they have been so used 15 to 20 years. Under the act of September 21, 1922 (42 Stat. L. 994, 995), a reversionary clause is placed in each patent so issued.

INDIAN SUITS AND JUDGMENTS

The United States Court of Claims in the case of *Osage Tribe v. United States*, No. B-38, commonly known as the Osage civilization fund suit, held, May 28, 1928, that it had no power to change the terms of a treaty with the tribe, which "is the function and province of the political department of the Government"; and that the plaintiffs failed to sustain their claims. The attorneys for the Indians, it is understood, will appeal to the Supreme Court.

The Court of Claims held June 8, 1925 (53 Ct. Clms., 67), that the claim of the Yankton Band of Sioux to ownership of the so-called Red Pipestone Quarry property (640 acres) near Pipestone, Minn., was without merit as these Indians still possessed the restricted treaty right of quarrying stone therein. Upon appeal the United States Supreme Court held November 22, 1926 (272 U. S. 351), that the quarry tract was the property of the Yanktons, and that it had been taken as under eminent domain for Indian school purposes by the Government. The case was remanded to the lower court for a finding and decree as to the proper amount due the band for the value of the property so taken.

April 16, 1928, the Court of Claims awarded these Indians the sum of \$100,000, with interest at 6 per cent from March 1, 1891, until paid. Appeal from the award has been taken to the Supreme Court by the claimants.

April 23, 1923, the Court of Claims dismissed as without merit the suit of the Sisseton and Wahpeton Sioux against the United States. The act of March 4, 1927 (44 Stat. L. 1847), authorized an appeal to the Supreme Court, which in its decision of May 28, 1928, affirmed the finding of the lower court. The court held in brief that it had power to consider only claims arising under treaties or laws of Congress and could not go behind them to permit recovery of amounts in excess of those provided for therein; and that power to abrogate

express provisions of the treaties and statutes is political and not judicial.

During the year approximately 10 suits have been filed in the Federal Court for the Western District of Washington, claiming land on the Quinaielt Reservation, Wash., for about 45 children belonging to the Elliott and other related families. The cases have been heard but no decisions have as yet been reported.

The act of June 7, 1924 (43 Stat. L. 596), authorized certain squatters on the Pyramid Lake Indian Reservation, Nev., to obtain patents by purchase of lands which they have used for approximately 25 years. Senate Bill 2081, Seventieth Congress, first session, to authorize the issuance of patents on payment of \$2.50 per acre instead of at the appraised valuation, failed of enactment. Payment for the lands has not yet been made in most instances and action has been instituted to obtain settlement.

The United States Circuit Court of Appeals of Philadelphia, Pa., in its decision of March 9, 1928, upheld the judgment of the Federal district court in a case involving the right of Canadian Indians to cross the international boundary into the United States without first obtaining a passport. The district court had held that the Indians had the right to cross freely between the United States and Canada under the terms of the treaty between the United States and Great Britain of November 19, 1794 (8 Stat. L. 116), U. S. Ex. Rel. Paul Diabo *v.* John McCanless, 18 Fed. (2) 282.

SUITS INSTITUTED AGAINST THE UNITED STATES

Suits not mentioned in the report for 1927 have been entered in the United States Court of Claims for the settlement of Indian claims, as follows:

Assiniboine Tribe, Fort Belknap and Fort Peck Reservations. Mont.; petition filed January 30, 1928.

Black River, Saginaw and Swan Creek Bands of Chippewa of Michigan; petition filed June 30, 1927.

Caddo Tribe of Oklahoma; suit filed May 21, 1927.

Cheyenne and Arapaho Tribes of Wyoming, Montana, and Oklahoma; suits filed February 26 and April 13, 1927.

Chippewa Tribes of Minnesota; suits filed May 5 and July 5, 1927.

Crow Tribe, Crow Reservation, Mont.; suit filed June 13, 1927.

Delaware Tribe of Oklahoma; suits filed March 3, May 31, and June 2, 1927.

Shoshone Tribe, Wind River Reservation, Wyo.; suit filed May 27, 1927.

RIGHTS OF WAY

Codification of the regulations under the various rights of way laws was completed and will be available as soon as a printed supply can be obtained. A right of way was granted to the railroad through the San Carlos Reservation, Ariz., as one of the steps necessary to secure the abandonment and removal of the existing railroad within the flowage area of the Coolidge Reservoir. By act of April 21, 1928, certain sections of the Code of Laws of the United States of America, in force December 6, 1926, and the basic acts of Congress cited in such sections, regarding rights of way for railroads, highways, telephone and telegraph lines, and oil and gas pipe lines, were made applicable to the lands of Pueblo Indians of New Mexico. Much benefit to the Indians as well as to applicants for rights is expected to result from the provisions of this act.

Although less than during the preceding year it is noteworthy that applications for the opening of more than 700 miles of public highways have been approved.

OIL AND GAS

Oil and gas mining leases were approved on approximately 208,000 acres of restricted Indian lands within 18 different reservations. A number of leases were made within reservations where there were no oil or gas producing wells and where heretofore there has been little or no oil leasing activity, particularly within the Cheyenne River Reservation, S. Dak., where 4,960 acres were leased, and the Cheyenne and Arapaho Reservation, Okla., where 15,558 acres were leased; also 1,520 acres were leased in Montana belonging to Chippewa Indian allottees under jurisdiction of the Turtle Mountain Agency.

There were 256 producing oil wells and 27 producing gas wells drilled during the year on restricted lands belonging to allottees of the Five Civilized Tribes in Oklahoma, which bring the total of producing oil and gas wells on lands of these Indians under supervision to 5,290 and 226, respectively. The total number of barrels of crude oil produced and sold from lands of the Five Civilized Tribes was 25,854,133, being nearly double the amount produced during the prior year. This increase in production was due in a measure to new discoveries in the Seminole country, although concerted effort to curtail production in that region was put forth by the operators. In the Osage Reservation where an attempt was also made to hold down production as far as possible, there were approximately 4,000,000 barrels less crude oil produced than during the prior year. The Osage Tribe received more than \$11,500,000 from oil and gas leases during the year, while the Indians of the

Five Civilized Tribes received in excess of \$5,500,000 from their leases.

The income from all oil and gas mining leases on restricted Indian lands for the year amounted to approximately \$17,809,752, and the total production of crude oil was 48,891,314 barrels. About \$16,600 was collected as oil and gas leasing fees and covered into the Treasury as miscellaneous receipts, pursuant to certain provisions contained in the act of Congress, approved February 14, 1920 (41 Stat. L. 408, 415).

QUAPAW LEAD AND ZINC MINING LANDS

The lands of the Quapaw Reservation, Okla., are rich in deposits of lead and zinc. These lands lie in what is known as the Tri-State lead and zinc mining district. Mining was first conducted within the reservation in 1902, and since 1917 the production of zinc lead ore has increased enormously. During the year the mines of these Indians under departmental supervision produced 36.2 per cent of the lead and 28.1 per cent of the zinc output from the Tri-State district, and about 3.9 per cent of the lead and 15.5 per cent of the zinc output from ore mined in the United States. At the close of the fiscal year, there were 55 departmental lead and zinc mining leases in force, embracing 7,284 acres; and 49 subleases in force covering 2,374 acres. From these leases 215,993 tons of lead and zinc concentrates were sold during the year for \$9,425,525. The royalty of the Indians amounted to \$894,820 and in addition they received \$2,869 collected as advance rental paid in lieu of royalty on nonproducing leases.

FIVE CIVILIZED TRIBES IN OKLAHOMA

The remaining tribal property (including amounts uncollected from sales of tribal land and minerals) of the Choctaw and Chickasaw Nations is valued at \$10,444,104. The amounts to be collected from Choctaw and Chickasaw tribal property heretofore sold aggregate \$944,754. The present tribal property of the Creek Nation is valued at \$92,050 and that of the Seminole Nation at \$30,000. The amounts to be collected on Creek tribal property heretofore sold aggregate \$27,334. A few small tracts of land belonging to the Cherokee Nation are yet to be disposed of and the sum of \$153 remains to be collected on Cherokee tribal property heretofore sold, otherwise the Cherokee tribal affairs, except pending litigation in the United States Court of Claims, are practically closed.

During the year legislation was obtained under which, and upon certain terms and conditions the purchasers of the segregated coal and asphalt deposits of the Choctaw and Chickasaw Nations heretofore sold might obtain limited additional time within which to make payments of the deferred and delinquent installments of the purchase

price. There are approximately 12,000 enrolled Indians of the restricted class in the Five Civilized Tribes, of whom approximately 9,000 are full bloods. The present restricted allotted lands aggregate 1,737,702 acres. During the year legislation was obtained extending the restrictions on the restricted allotted and inherited lands for a period of 25 years from April 26, 1931. The cashier for the Five Civilized Tribes Agency handled during the year a total of \$32,838,363, including receipts and disbursements of all classes of funds. The collection of tribal funds amounts to \$236,164 and there was credited to the individual Indian accounts the sum of \$7,385,462. During the fiscal year there was disbursed from the restricted individual Indian moneys the aggregate sum of \$4,227,782 for maintenance of the restricted Indians and for their farms, buildings, livestock, and equipment. The total amount expended from individual Indian accounts for permanent improvements during the year was \$485,776. The above-mentioned expenditures for the benefit of the individual restricted Indians were made under the supervision of the field force of the Five Civilized Tribes Agency. From reports received it appears that the Indians are beginning to appreciate more and more each year the importance of farming their land along remunerative lines and otherwise engaging in different kinds of work for the support of their families. The restricted Indians are encouraged in their efforts to depend on their own resources and on their ability as farmers and raisers of livestock. It is reported that in open competition the products of the restricted Indian farmers have won many premiums at county, district, and State fairs. This indicates that the Indians realize the economic necessity of raising products of a high standard. Many applications have been received during the year for new homes and farm improvements, and as a result many substantial homes have been built and many more are under construction.

PROBATE ATTORNEYS, FIVE CIVILIZED TRIBES

The work of our probate attorneys in eastern Oklahoma continued with beneficial results to the restricted Indians of the Five Civilized Tribes and Quapaw Agencies. Those Indians, who for want of education, lack of business experience, or because of age or other conditions are unable to properly protect themselves in matters affecting their property, are advised and assisted by these attorneys in matters relating to guardianship, administration of estates, transactions of various kinds concerning inherited and restricted property, and are advised regarding the conservation and use of their restricted lands and funds.

Besides examining witnesses and preparing cases for the courts and prosecuting or defending them to a final conclusion, the probate

attorneys hold consultations with the Indians seeking aid, prepare leases and other legal instruments for the Indians, investigate the validity of legal instruments submitted to them by the Indians, and often aid in placing minor Indians in schools.

The following statistical table shows certain savings to the Indians of the Five Civilized Tribes accomplished by these attorneys for the fiscal year, but does not represent the entire amount actually saved for the reason that many savings are effected in cases where the amount recovered can not be determined in dollars and cents:

Number regular cases in which attorneys appeared.....	2, 167
Amount involved in civil actions, land and partition suits not included..	\$26, 252
Number criminal actions instituted.....	7
Number new bonds filed.....	115
Amount covered by new bonds.....	\$219, 750
Number guardians removed or discharged.....	154
Conservation of funds: Investments.....	\$200, 000
Amounts saved to minors and others.....	\$67, 307
Number quitclaim deeds obtained.....	52

DEPOSIT AND INVESTMENT OF INDIAN FUNDS

A total of \$1,158,994 in interest was paid by the banks holding Indian funds, \$391,842 of which accrued to Osage Indians and \$287,950 to members of the Five Civilized Tribes. The usual rate obtained on time deposits was $3\frac{1}{2}$ per cent, but in some instances rates as high as 4 and 5 per cent were paid by depositories. Aggregate deposits averaged during the year approximately \$35,000,000, and on June 30, stood at \$37,215,608 secured by \$24,916,800 Government bonds and \$16,658,858 surety bonds. Deposits were carried by 598 States and national banks located principally in the north-west, north central, and south central sections of the country.

Whenever banking facilities proved inadequate, surplus funds were invested in Government securities of various issues, yielding from $3\frac{3}{8}$ to $4\frac{1}{4}$ per cent. The total amount of such investments was \$25,365,000 on June 30, and of this amount \$16,000,000 represented Osage funds and \$8,000,000 funds of members of the Five Civilized Tribes.

FORESTRY

The fiscal year 1928 witnessed no marked revival in the lumber trade. In fact throughout the greater part of the year there was a constant tendency toward lower prices both for logs and for finished timber products. Although the volume of trade has been normal, the market has been controlled by the purchaser and only the more favorably situated or most skillfully managed operations have shown a satisfactory return on the invested capital. Under these conditions the office has not sought to offer timber for sale unless there were special circumstances making an immediate offering desirable.

A small sale on the Santa Clara Pueblo was made late in the year 1927; about 18,000,000 feet of timber on the Kalispel Reservation in Washington was offered in February, 1928, to meet the urgent needs of allottees; and three units on the Klamath Reservation were offered under sealed bids opened in late March and early April, 1928. The offerings at Klamath were inadvisable from the standpoint of maintaining a sustained yield there, but were thought to be justified as a measure of forest sanitation and the salvage of values which might otherwise be lost. Since 1920 there has been a serious infestation of dendroctonus beetles on the Klamath Reservation. This infestation seemed to be receding in 1923-24, but during the period 1925-1927 it spread with alarming rapidity in the southeastern part of the reservation. Very heavy losses had already occurred on allotments within the Paiute district and it seemed advisable to offer the Five Mile, Paiute, and Kanott units, comprising approximately 340,000,000 feet, for sale under forms of contract which would require prompt logging of the areas. A bid of the minimum prices of \$5 per 1,000 feet for yellow pine and sugar pine, \$2.50 per 1,000 feet for Douglas fir and incense cedar, and \$1 for other species was received on the Five Mile unit. No bids were received on the other units. In view of the depressed lumber market, the great damage from bark beetles, and the comparative inaccessibility of the units the failure of operators to exhibit keen interest in the units was not unexpected.

The great expansion in timber operations on the Klamath and Taholah Reservations during the fiscal year 1927, together with the resumption of operations on the Red Lake Reservation by the International Lumber Co., resulted in an exceptionally heavy cut in 1927. The value of the timber removed from Indian lands by contractors during the fiscal year 1927 was \$2,806,871.72. If there be added to this the stumpage value of the timber cut for manufacture at the Neopit and Redby mills on the Menominee and Red Lake Reservations, the total stumpage value for that year rises to \$2,953,202.10. Operations under the sale of 1917 to the International Lumber Co. on the Red Lake Reservation were completed during 1927. Under this contract there were cut 105,042,800 feet of saw timber and considerable quantities of cedar and other by-products, for all of which \$1,395,585.46 was received. Within all parts of the area not severely burned seed trees were left and satisfactory reseedling will be attained on much of the sale area.

Logging operations have been comparatively light during 1928 on the Jicarilla, Mescalero, and Spokane Reservations and the unfavorable lumber market restricted the production on the Colville and Flathead areas. While full data for the fiscal year 1928 is not available, it is known that the total value of the stumpage cut will exceed \$2,250,000.

On July 1, 1927, the logging and milling operations on the Menominee Reservation were segregated from the Keshena Agency and full responsibility for all forestry activities on the reservation was assigned to the manager of the Menominee Indian Mills. The results attained during the year appear to justify fully the return to a plan of organization that was inaugurated April 1, 1908, but abandoned July 1, 1910. The lumbering activity at Neopit is primarily a commercial enterprise of an entirely different character from the activities of an Indian agency. The Neopit business of more than a half million dollar turnover annually is of sufficient magnitude to require the undivided efforts of a man specially trained in forest management and commercial methods. Fortunately the reorganization at Neopit has been contemporaneous with a revival of interest in forestry practice in the State of Wisconsin. The rapidly crystallizing conviction of private owners of timberland in the Lake States as to the possibilities of commercially profitable forest management has aided materially in overcoming the prejudice against conservative lumbering that formerly hampered, or even nullified, attempts to apply sound forestry principles to the Menominee timberlands. The possibilities of future success are very encouraging.

IRRIGATION

Effective June 30, 1928, Supervising Engineer Herbert V. Clotts of irrigation district No. 4 was made chief irrigation engineer of the Indian Service.

Progress on the Coolidge Dam being constructed across the Gila River near San Carlos, Ariz., has been marked. Though the contract requires completion of the dam by June 30, 1929, the present program will result in its completion in October, 1928. By the close of the fiscal year the domes and buttresses of the dam were constructed to an elevation of 2,509, which completed the buttresses but left the top portion of the domes yet to be constructed. The actual pouring of concrete on the dam was started November 24, 1927, and continued steadily throughout the remainder of the fiscal year, with the result that 918,000 cubic yards of concrete had been placed in the buttresses of the dam, and 67,900 in the domes. In the spillways 6,400 cubic yards were placed in the floor and spillway weir; 1,650 cubic yards in the walls and guide walls; 2,500 cubic yards in the bridge piers and wall supports of the bridges, and 3,500 cubic yards in the power house base. Less than 30,000 cubic yards yet remain to be placed in the dam and spillway structures.

The Interior appropriation act approved March 7, 1928, authorized the Secretary of the Interior to incur obligations, and enter into contract for the development of electrical power at the Coolidge Dam as an incident to the use of the Coolidge Reservoir not to exceed the

sum of \$350,000. Funds were made available for the power development by the second deficiency act, approved May 29, 1928. The installation of the power machinery must be deferred until after completion of the dam.

It would appear that the contractor will be unable to close the opening in the dam left for by-passage of the waters of the Gila River until after removal by the Southern Pacific Railway of its tracks and road bed which are within the reservoir area.

Owing to conditions mentioned and the fact that it was necessary to excavate some 75,000 cubic yards more material from the dam base and spillways than estimated, it appears at this time that the estimate for the construction of the dam will be slightly increased by probably \$100,000, the original estimate being \$5,500,000 for the completed structure.

During June, two of the consulting engineers, Maj. Gen. W. C. Langfitt and Andrew J. Wiley, inspected and approved the construction work being done.

Pursuant to provisions contained in an act approved March 7, 1928, directing that the Federal Power Commission shall within 60 days after the approval of the act report to Congress what compensation, if any, in addition to that already provided, shall be paid to the Apache Indians of the San Carlos Reservation by reason of the generation of hydro-electric power at the Coolidge Dam, that commission reported that no additional compensation was due these Indians as the power development was incidental to the construction of the Coolidge Dam and impounding reservoir and not by reason of any natural power site that might have existed.

Organization work of the San Carlos project which is to be served by the waters impounded in the Coolidge Dam has progressed. The landowners' agreement previously approved as to form by the department was executed by persons owning lands considerably in excess of the area that could be designated within the project. The designation of the privately owned lands forming the project was approved April 25, 1928. The area was restricted to 50,000 acres, being a like area to that in Indian ownership within the Gila River Reservation coming within the project. The individual holdings under the provisions of the act of June 7, 1924, are restricted to 160 acres. After designation of the lands steps were immediately taken, in accordance with statutory requirements, to circulate the petition for the formation of the irrigation district. Progress is being made, and it is believed that the district will actually be formed and ready to execute the required contract by January, 1929.

Progress on the Gila River adjudication suit, it is understood, is being made by the Department of Justice.

Legislation was secured authorizing surveys and investigation to determine the feasibility of irrigating the Michaud division and other

lands in the Fort Hall Indian Reservation, Idaho, for which an appropriation of \$25,000 was made. There was also appropriated \$145,000 for continuing construction work on the Fort Hall irrigation project to provide irrigation facilities for the Gibson unit of the project, which work, when completed, will provide such facilities for approximately 10,000 additional acres under the project.

On March 13, 1928, legislation was approved authorizing the Secretary of the Interior to contract with the Middle Rio Grande conservancy district, a political subdivision of the State of New Mexico, to provide irrigation, reclamation, conservation, and flood control for six of the pueblos, namely, Cochiti, Santo Domingo, San Felipe, Santa Ana, Sandia, and Isleta. This subject is discussed in the Foreword to this report.

Irrigation districts were formed on the Flathead irrigation district, Montana, in pursuance to State law and as required by legislation applicable to this project. The form of agreement to be executed by these districts, approved by the department on December 16, 1927, has not been returned, though the Flathead district formation had been confirmed by the court, but an appeal had been filed by some of the dissenting landowners, which held up execution of the agreement. This district embodies approximately 80,000 acres of the project. Much needed construction work on the project can not be carried on under the provisions of the legislation until after the executed agreements have been received and approved by the department. The legislation applicable to this project was modified so as to authorize the Secretary of the Interior to either construct a power project at the Polson site of the Flathead River or to construct a transmission line for the distribution of power in the event that a license be issued to an outside company for the development of the total hydroelectric resources at that site.

There are pending seven suits affecting water rights of Indian irrigation projects. In addition to the principal activities mentioned, the usual operation and maintenance of the projects in the five irrigation districts has been conducted.

PUEBLO LANDS BOARD

The work of the Pueblo Lands Board, established by the act of June 7, 1924, to quiet titles to Pueblo Indian lands in New Mexico, was continued and reports were submitted during the year on the pueblos of Santo Domingo, Sandia and San Felipe.

Suits that were instituted to quiet title in the Indians to the pueblos of Taos and Nambe have been settled, and the time granted under the act cited for review has expired in most of the cases upon which report has been made. The board accordingly recommended

that the damages awarded the Indians for losses of lands and water-rights, be appropriated by Congress, as follows:

Santo Domingo.....	\$13, 888. 20	Santa Ana.....	\$5, 035. 54
Sandia.....	20, 950. 90	Nambe.....	26, 668. 63
San Felipe.....	20, 341. 10		
Taos.....	48, 497. 00	Total.....	135, 381. 37

PURCHASE OF SUPPLIES

As a result of the intensive program planned and carried out during the year, further progress was made in the early delivery of supplies to the field units and bids on supplies for 1929 were opened fully six weeks earlier than in the prior spring, which has resulted in a large part of the supplies contracted for being received in the field before June 30, 1928. This is the nearest approach to accomplishment of what is desired, since the period antedating the World War. Cereal products, canned fruits, canned vegetables, and other items heretofore purchased in the fall in order that the new crop might be obtained were contracted for in March and April for the first time in more than 20 years.

With the assistance of the Bureau of Mines, both in the selection of coal and as to changes in the heating plants, serious complaint was avoided during the winter with regard to the heating of field units.

A general improvement was noted in the quality of wearing apparel. An exception applied to shoes for men and women (large boys and girls), which were manufactured in the Federal penitentiary, Leavenworth, Kans. Congress has directed that shoes for Government activities be made in the new shoe factory established at Leavenworth. A survey of the criticisms received from field officers concerning the wearing qualities of these shoes has enabled the service to procure new models made of better sole leather and improved stitching, which should remove the cause for complaint on future deliveries. Models have been selected also for the small girls and boys. Consequently all Indian Service leather shoes will hereafter be manufactured at the Federal penitentiary.

The system of paying general contract supply bills at Chicago and San Francisco instead of through individual field officers has fulfilled expectations, resulting in almost immediate payment for the goods delivered after they were inspected and accepted. A saving of more than \$30,000 in discounts was made during the fiscal year, the larger part of which resulted from payments made at the warehouses. Nearly twice that amount will be saved annually hereafter through closer competition due to deduction by bidders of allowable discounts before quoting, rather than by making the discount contingent upon prompt payment.

BUREAU OF PENSIONS

The annual record of the activities of the Bureau of Pensions is an added chapter to the history of a grateful Nation's attempt to express in practical terms its sense of an obligation which can never be fully measured nor discharged. Statistics, though necessary, can not tell the story of the timely and well-deserved aid which has helped to lessen the burden of impaired health and of advancing years.

The principal function of this bureau is the execution of the laws granting pensions arising out of service with the United States military and naval forces—exclusive of the period between April 6, 1917, and July 2, 1921. It also administers the laws providing for the retirement of civil-service employees.

As a priceless by-product of the adjudication and allowance of pensions—involving since 1789 the distribution of nearly \$8,000,000,000—the archives of the Pension Office contain the biographies of thousands who gave themselves to the service of their country, and whose life histories are fraught with stories of heroism and devotion. Like a huge book of many volumes, the files portray, in intimate and fascinating details, the lives of patriots and their associates; their lineage, aspirations, and achievements, as well as their afflictions, needs, and frailties. Here are recorded and made available to posterity the deeds of patriotic Americans who gave generously to the Nation and thus earned its benediction which can not be adequately expressed in mere words and gratuities.

Notwithstanding the decimation by death of the ranks of Civil War survivors and their dependents, the aggregate number of pensioners on the roll at the end of the fiscal year 1928 was 1,252 greater than at the beginning of the year. The average annual loss of more than 10,000 was overcome and a net gain—the first in any year since 1905—was made. This increase would seem to indicate that annual decreases may not be expected for some years.

During the fiscal year the amount disbursed for pensions was \$228,965,672.49, a decrease of only \$1,187,039.68 over the previous year. This high level of expenditures in 1928 was maintained, not because of any new legislation during the year, but because under the stimulus of the attractive rates of the act of May 1, 1926, and of the act of March 3, 1927, claims for pension on account of service in the War with Spain and the Indian wars were filed and established in such numbers that, although expenditures for Civil War pensions in

1928 decreased \$16,824,232.39, those for War with Spain pensions increased \$13,441,590.97 and those for Indian war pensions increased \$1,943,177.38. An increase of nearly \$200,000 for regular establishment pensions was also registered.

There are now on the roll approximately 144,800 Spanish War veterans who are receiving less than \$50 per month. Almost every one of these is a potential claimant for increase of pension. Of the 414,000 soldiers who served in the War with Spain there are probably more than 100,000 who have not yet applied for pension. The number of claims arising out of service in the regular establishment since July 2, 1921, is steadily increasing.

As a reflex of the work of the bureau in so far as the administration of the laws for the retirement of civil-service employees is concerned, an increase in the number of annuitants of 1,264 is noted, the total number of annuitants at the close of the fiscal year being 15,383. The disbursements from the "civil-service retirement and disability fund" were \$14,761,616.75, an increase of \$1,300,908.93 over the previous year. On June 30, 1928, the retirement fund amounted to \$83,078,000.43. Under the terms of the appropriation act of March 7, 1928, the Government added to this fund on July 1, 1928, the sum of \$19,950,000, its first contribution toward the financing of the liability of the United States created by the civil service retirement laws.

FISCAL OPERATIONS

Comparison of amounts paid out for the fiscal years 1927 and 1928:

For pensions during the fiscal year:	
1927-----	\$230, 152, 712
1928-----	228, 965, 672
For fees and expenses of examining surgeons:	
1927-----	534, 934
1928-----	495, 687
For field and special examinations:	
1927-----	95, 000
1928-----	119, 565

The total cost for maintenance and expense of the pension system for the last five years was as follows:

1924-----	\$1, 497, 699
1925-----	1, 498, 087
1926-----	1, 436, 001
1927-----	1, 327, 252
1928-----	1, 214, 565

(The above figures do not include amounts paid out for fees and expenses of examining surgeons and for special examinations.)

Number of employees for pension work carried on the pay roll at the beginning of each of the following fiscal years:

1924-----	987
1925-----	837
1926-----	789
1927-----	725
1928-----	649

Information of general interest

Pensioners on roll June 30	1927	1928	Pensioners by classes, June 30	1927	1928
Civil War:			Soldiers.....	245, 866	258, 620
Soldiers.....	90, 000	74, 929	Nurses.....	328	410
Nurses.....	49	43	Widows.....	236, 317	224, 714
Widows, etc.....	212, 642	197, 934	Minors.....	2, 321	2, 346
War with Spain:			Helpless children.....	899	893
Soldiers.....	138, 812	164, 708	Other dependents.....	4, 211	4, 211
Nurses.....	279	367	Total.....	489, 942	491, 194
Widows, etc.....	23, 547	26, 195			
Regular Establishment:			Losses to roll by death:		
Soldiers.....	13, 085	13, 665	Civil War—		
Widows, etc.....	3, 455	3, 555	Soldiers.....	16, 958	15, 237
World War:			Widows, etc.....	20, 828	21, 036
Soldiers.....	48	47	Other classes—		
Widows, etc.....	17	17	Soldiers.....	3, 353	4, 172
Indian wars:			Widows, etc.....	855	1, 017
Soldiers.....	3, 915	5, 267	Total.....	41, 994	41, 462
Widows, etc.....	3, 100	3, 604			
War with Mexico:					
Soldiers.....	6	4			
Widows, etc.....	970	845			
War of 1812: Widows.....	17	14			
Total.....	489, 942	491, 194			

Claims pending June 30, 1927.....	71, 688
Received during the year.....	118, 521
Disposed of during the year.....	147, 620
Claims pending June 30, 1928.....	42, 589
Largest number Civil War soldiers on the roll was in 1898.....	745, 822
Largest number of Civil War widows on the roll was in 1912.....	304, 373

Income, refundments, etc.:	
For addresses, certified copies, etc. (act Aug. 24, 1912).....	\$3, 282. 40
Refundments to pension appropriations.....	13, 759. 64
Miscellaneous.....	90. 00
Total.....	17, 132. 04
Amounts allowed as reimbursement for expenses of last sickness and burial of deceased pensioners in 1928.....	125, 976. 84

CIVIL WAR CLAIMS AND PENSIONS

The close of the fiscal year 1928 shows but 74,929 of the 2,213,365 soldiers who served in the Civil War in receipt of pension. Of these, 31,528 were in receipt of \$65 per month; 35,902, \$72 per month, because so nearly helpless or blind as to need the aid and attendance of another person; and 6,818, \$90 per month, by reason of a condition of total helplessness or blindness. During the past fiscal year 15,237 Civil War veterans died, or 17 per cent of the total number on the roll at the beginning of the year. Pensions aggregating \$69,683,556.28 were paid to Civil War veterans during the fiscal year 1928.

On July 1, 1927, there were pending 6,268 claims of soldiers on account of Civil War service. During the fiscal year 9,729 claims were received and 15,599 claims were disposed of, leaving 398 claims pending on June 30, 1928. Practically all of these claims were for increase of pension based on conditions of total helplessness or blindness, or such a degree of helplessness or blindness as to necessitate the aid and attendance of another person.

On July 1, 1927, there were pending 4,039 claims of widows and minor children of Civil War soldiers. During the year 7,462 claims were received and 8,755 claims were disposed of, leaving 2,746 claims pending June 30, 1928.

At the close of the fiscal year 197,934 widows, minors, and dependents of Civil War soldiers were in receipt of pension as against 212,642 at the beginning of the year, a net loss to this class of 14,708. The gains to the roll for the year were 6,701 and the losses, 21,409, of which 21,036 were due to deaths. The disbursements for pensions to widows, minors, and dependents of Civil War soldiers in the past fiscal year amounted to \$79,958,669.91.

The total disbursements for pensions of all classes on account of Civil War service for the fiscal year 1928 were \$149,668,976.19 as against \$166,493,208.58 for the fiscal year 1927.

On July 1, 1921, there were pending 32,638 Civil War pension claims. In the past seven years 300,089 claims have been received and 329,583 claims disposed of, leaving 3,144 claims pending on June 30, 1928.

SPANISH WAR CLAIMS AND PENSIONS

At the close of the fiscal year 164,708 Spanish War veterans were on the pension roll as against 138,812 at the beginning of the year, a gain of 25,896. The disbursements for pensions to soldiers of the War with Spain in the past fiscal year amounted to \$59,908,097.53, as against \$47,612,810.61 for the year 1927. Of the veterans on the roll at the close of the fiscal year 45,881 were in receipt of \$20 per month; 39,374, \$25 per month; 36,276, \$30 per month; 23,516, \$40 per month; 16,992, \$50 per month; and 1,193, \$72 per month, the rate for such condition of helplessness as necessitates aid and attendance of another person.

On July 1, 1927, there were pending 41,665 claims of soldiers based on Spanish War service. During the fiscal year 65,868 claims were received and 84,295 claims were disposed of, leaving 23,238 claims pending on June 30, 1928.

On June 30, 1928, there were 26,195 widows, minor children, and dependents of Spanish War soldiers on the roll as against 23,547 on June 30, 1927, a gain of 2,648 for the year. The disbursements to this class of pensioners in the past fiscal year amounted to \$10,615,696.56, as against \$9,516,405.61 in the previous year. The total disbursements to all classes of pensioners on account of Spanish War service for the fiscal year 1928 amounted to \$70,674,419.27; for 1927, the amount was \$57,232,828.30.

On July 1, 1927, there were pending 3,480 claims of widows, minor children, and dependents of Spanish War soldiers. During the year 5,164 claims were received and 5,529 claims were disposed of, leaving 3,115 claims pending on June 30, 1928.

There were pending 45,207 claims of all classes based on service in the War with Spain on July 1, 1921. In the past 7 fiscal years 425,698 claims were filed and 444,552 claims were disposed of, leaving 26,353 claims pending on June 30, 1928.

OTHER PENDING CLAIMS

In addition to the 3,144 claims pending June 30, 1928, on account of Civil War service and the 26,353 claims based on Spanish War service, there were 13,092 claims pending under laws other than those granting pensions on account of Civil War and Spanish War service. Of these, 5,888 are based on disability or death claimed as the result of diseases or injuries originating in the line of duty in the military or naval service. As claims based on disease contracted or personal injury suffered in the military or naval service since July 2, 1921, must be presented for adjudication by the Pension Bureau, the filings of claims of this class are on the increase. In the past year, 15,560 of these claims were before the bureau for settlement as against 12,185 in the previous year.

Under the new Indian wars service act of March 3, 1927, there were 9,414 claims before the bureau for action of which 7,740 were disposed of, leaving 1,674 pending on June 30, 1928. Claims before the bureau for settlement under the act of March 2, 1895, for the accrued pension due at date of death of pensioner, during the year numbered 12,695, of which 9,543 were disposed of, leaving 3,152 pending on June 30, 1928. Of the 5,286 claims for reimbursement of expenses of last sickness and burial of deceased pensioners, 4,240 were settled, leaving 1,046 pending at the close of the year. Claims filed by deserted wives and children of soldier pensioners for one-half pension numbered 747, of which 439 were disposed of, leaving 308 on hand on June 30, 1928. The total number of claims of all classes before the bureau for settlement during the last fiscal year was 190,209, of which 147,620 were disposed of, leaving 42,589 pending on June 30, 1928.

For service connected disabilities there was paid during the past fiscal year \$3,255,566.50 to 13,665 soldier pensioners; because of death of soldiers due to service disabilities, 3,555 widows, minor children, and dependents received \$840,196.73 during the year. To 5,267 soldiers and 3,604 widows granted pension on account of Indian wars service, \$3,956,943.80 were paid in the past year. On account of Mexican War service there were 4 soldiers and 845 widows in receipt of pension on June 30, 1928, and to this class payments for the year amounted to \$544,406.46. There are yet 14 widows on the roll because of service in the War of 1812 of their soldier husbands and they were paid pension to the amount of \$8,903.34 last year.

SPECIAL ACTS OF CONGRESS

The Seventieth Congress, in its first session, passed three omnibus bills granting pensions by special acts to 3,596 individuals. Since March 4, 1861, the Congress has granted pension by special acts in 72,850 cases. On June 30, 1928, there were 10,036 persons in receipt of pension by reason of special legislation, as against 9,924 on June 30, 1927.

DISBURSEMENTS

In the fiscal year 1928 the disbursements for pensions amounted to \$228,965,672.49, and of the total funds available for pensions the balance on hand June 30, 1928, was \$264,453.35. For fees and expenses of examining surgeons \$495,681.22 were disbursed. The amount paid out for annuities and refunds under the civil service retirement law was \$14,761,616.75. The total disbursements in the past fiscal year were \$244,222,970.46, which required the issuance of 6,115,660 checks.

Included in the amount disbursed for pensions are \$5,977,856.51 paid to inmates of the United States Soldiers' Home and the 10 branches of the National Home for Disabled Volunteer Soldiers. From these homes 16,194 notices of admissions, discharges, and transfers were received during the year, necessitating changes in the records to conform with the notices. In addition to this, changes in post-office addresses of pensioners, averaging 11,200, were made monthly.

NATIONAL SOLDIERS' HOME

As thousands of pensioners annually avail themselves of the care and attention afforded by the 10 branches of the National Home for Disabled Volunteer Soldiers, it seems proper to call attention to the act of Congress approved March 26, 1928, extending the benefits of these homes. This act provides that "honorably discharged officers, soldiers, sailors, or marines, including women commissioned or enlisted, and Army and Navy nurses under commission, enlistment, appointment, assignment, or contract since April 21, 1898, who served in the Regular, Volunteer, or other forces of the United States or in the Organized Militia or National Guard when called into Federal service, and who are disabled by disease or wounds and have no adequate means of support, and by reason of such disability are either temporarily or permanently incapacitated from earning a living" are entitled to the benefits of the National Home for Disabled Volunteer Soldiers.

The branch homes of the National Home are located at Sawtelle, Calif.; Marion, Ind.; Danville, Ill.; Leavenworth, Kans.; Togus, Me.;

Dayton, Ohio; Hot Springs, S. Dak.; Johnson City, Tenn.; Hampton, Va.; and Milwaukee, Wis. Any person coming within the provisions above mentioned may apply for admission either in person at any one of the homes, or by letter addressed to the president of the board of managers, National Home for Disabled Volunteer Soldiers, National Military Home, Dayton, Ohio.

SUBMARINE ACCIDENTS—DOUBLE PENSION

An act of Congress, approved April 27, 1928, provides that "hereafter in all cases when an officer or enlisted man of the United States Navy is disabled, has died, or shall die as the result of an accident to a submarine vessel, said officer or enlisted man having been employed in duty on or in handling the submarine at the time of such accident, the amount of pension to be paid such officer or enlisted man, his widow or dependents, shall be double the amount of that authorized to be paid under existing pension laws should death have occurred by reason of an injury received in service in line of duty, not the result of a submarine accident." Double pensions are now provided in cases where disability or death results from an aviation or submarine accident occurring in the United States Navy.

CIVIL WAR WIDOWS—INCREASE OF PENSION

On May 23, 1928, President Coolidge approved the bill passed by the Congress increasing from \$30 to \$40 per month the pension of widows and former widows of Civil War veterans who have attained the age of 75 years. This increase of pension as to all widows of Civil War veterans on the roll at date of approval of the act, who had attained the age of 75 years, commenced on June 4, 1928. Steps were taken promptly by the bureau to put this new law into effect. The cases of the 173,000 Civil War widows in receipt of \$30 per month were drawn from the files for examination and 103,858 widows were found to be of the requisite age entitling them to the \$40 rate. In July, 16,181 widows were paid at the new rate; in August, 60,442 received their increase of pension; and 27,235 were paid their additional pension early in September. In 60,733 cases the papers showed that the widows had not yet reached the age of 75 or were not otherwise entitled to the increase. The title to the \$40 rate of those found to be under 75 will be taken up by the bureau upon filing of requests for consideration made about the time the applicants are approaching the age of 75, and the \$40 rate in such cases will be made to commence on the date of attaining age of 75 years.

WAR OF 1812 WIDOWS

Although the War of 1812 ended over 113 years ago, there are yet 13 widows of soldiers of that war in receipt of pension at \$50 per month. They are as follows:

Arminia I. Anderson, Cedar Grove, Ga.; husband, Robert Anderson, fifer, Nabor's company, South Carolina Militia.

Emma Arnout, rural route 65, Ashville, N. Y.; husband, Samuel Arnout, private, Parker's company, New York Militia.

Marion A. Clark, Iowa City, Iowa; husband, John R. Clark, private, McClellan's company, Massachusetts Militia.

Mary Coleman, route 1, Claudeville, Va.; husband, Robert Coleman, private, Davenport's company, Virginia Militia.

Sarah J. Foster, The Kenesaw, Washington, D. C.; husband, Adams Foster, captain's clerk, Navy.

Lydia Ann Graham, Brushy Run, W. Va.; husband, Isaac Graham, musician, Bodkin's company, Virginia Militia.

Emma F. Graves, Hopewell, Va.; husband, John Graves, private, Field's company, Virginia Militia.

Mary Isgrigg, 588 Delta Avenue, Cincinnati, Ohio; husband, Daniel Isgrigg, private, Cullum's company, Ohio Militia.

Carolina King, East Aurora, N. Y.; husband, Darius King, private, Stevens' company, New York Militia.

Emma Mann, Greenbush, Mass.; husband, Thomas Mann, private Elen's and Hastings' companies, Massachusetts Militia.

Catharine Sandidge, Alto, Va.; husband, Anderson Sandidge, first lieutenant, Tinsley's company, Virginia Militia.

Louisa Wade, Jasper, Tenn.; husband, Farleigh Wade, private, Pryor's and Berchett's companies, Virginia Militia.

Mary A. Williams, 2641 Janney Street, Philadelphia, Pa.; husband, John M. Williams, private, Moore's company, Maryland Militia.

AVERAGE ANNUAL VALUE OF PENSIONS

Dividing the total number of pensioners on the roll on June 30, 1928, into the total amount of disbursements for pensions for the fiscal year 1928, it is shown that the average annual value of a pension, regardless of classes, is \$466.14. Taking into consideration the classes of pensioners, the average annual value of a pension for the Civil War veteran is \$931.06; for the Spanish War veteran, \$364.24; for the Indian war veteran, \$497.09; for the soldier, sailor, or marine suffering from disability contracted in line of duty while serving in the Regular Army, Navy, or Marine Corps in time of peace, \$238.24.

The average annual value of a pension for the widow of a Civil War veteran is \$404.53; for the widow of a Spanish War veteran \$413.86; for the widow of an Indian war veteran, \$371.46; and for

the widow of a soldier, sailor, or marine whose death was the result of a wound, injury, or disease suffered in line of duty while serving in the Regular Army, Navy, or Marine Corps in time of peace, \$236.34. In these values cognizance is taken of the additional amounts paid on account of minor children.

In cases based on service in the War with Mexico and the Civil War, substantial increase of rates of pension have been provided by the acts of May 1, 1920, July 3, 1926, and May 23, 1928. The soldiers, widows, and minor children whose claims are based on Spanish War service have had their pension rates increased by the act of May 1, 1926, and soldiers, widows, and minor children claiming pension on account of service in Indian wars have been granted substantial increases by the act of March 3, 1927. With the exception of rates for a few permanent specific disabilities, the rates of pension payable to soldiers, sailors, or marines suffering from disabilities of service origin in time of peace have not been increased since July 14, 1862, nor have the rates of pension for widows, minor children, and dependents of soldiers, sailors, or marines whose deaths were due to wounds, injuries, or diseases suffered in service and line of duty in peace time been increased since March 19, 1886, when the Congress provided the rate of \$12 per month with an allowance of \$2 per month additional for each minor child of the soldier under 16 years of age. This explains largely the wide discrepancies in rates paid to soldiers, widows, and minor children, discrepancies not readily understood by persons not conversant with the provisions of the various pension laws.

NUMBER OF PENSIONERS BY STATES

A frequent inquiry made of the bureau is as to the number of pensioners resident in various States, Territories, and foreign countries. This information is given in detail in one of the statistical tables appended to this report. Of the 491,194 pensioners on the roll on June 30, 1928, there were in the United States 484,331; in the Territories and Insular Possessions, 3,849; and in foreign countries, 3,014. The States having over 10,000 resident pensioners are as follows: Ohio, 43,740; Pennsylvania, 40,267; New York, 38,600; California, 33,104; Illinois, 33,096; Indiana, 27,897; Missouri, 22,899; Michigan, 19,233; Massachusetts, 17,879; Kansas, 17,736; Iowa, 15,624; Kentucky, 12,950; Wisconsin, 12,333; and New Jersey, 10,808.

INVESTIGATIVE SERVICE

The operations of the special examination division for the past five years are outlined in Table 18 of this report. The amount of work accomplished by the field inspectors shows a considerable

increase in the past year. The number of cases reported was 8,899, as against 7,299 for the previous year, an increase of 1,600 cases. The number of depositions taken was 35,962, as against 29,150 the previous year, an increase of 6,812 depositions. The number of cases disposed of was 7,980, as against 6,337 for the previous year, an increase in disposals of 1,643 cases. Reports of irregularities in pension matters in the Philippine Islands have been coming in recently in such large numbers as to make the assignment of an inspector to these islands advisable. Although this inspector has been in the islands but a few months, his reports show such a condition existing in the Philippine Islands as to make it advisable to have a check-up made of all pensioners resident in the islands and an investigation of all pending claims filed from that locality. There are 3,486 pensioners in the Philippine Islands to whom was paid last year the sum of \$793,308 in pensions.

CIVIL-SERVICE RETIREMENT

PROGRESS OF WORK

On July 1, 1927, 2,069 claims of all classes were pending. During the year just ended 26,193 original claims were filed, 224 were reopened, and 5,748 additional claims were received, making a total of 34,234 to be accounted for. There were 32,485 claims disposed of during the year, leaving a total of 1,749 pending on June 30, 1928.

The work in the retirement division is so nearly current that all claims receive prompt consideration as soon as filed. A great many claims, particularly in the case of those for refund, are settled within a few days after filing in the bureau, provided the evidence is complete.

FINANCIAL STATEMENT

According to the last annual report of the Commissioner of Pensions, the civil-service retirement and disability fund on June 30, 1927, showed a balance of \$68,336,760.95. The Secretary of the Treasury reports that \$26,454,611.68 was transferred to the fund during the last fiscal year, and that through the receipt of interest and profits and from miscellaneous sources the fund was increased by \$3,048,244.55, making a total of \$97,839,617.18 to be accounted for. The total disbursements for the fiscal year on account of annuities, refunds, and allowances amounted to \$14,761,616.75, leaving a balance in the fund on June 30, 1928, of \$83,078,000.43.

The foregoing balance does not include an appropriation of \$19,950,000 made during the last session of Congress for beginning the financing of the liability of the United States on account of the "civil-service retirement and disability fund." This credit, which was not available until after July 1, 1928, will appear in the next annual report.

LEGISLATION

No legislation affecting the retirement law was enacted during the last session of Congress. There were, however, several bills considered and one, S. 1727, passed the Senate and was favorably reported by the House Committee with an amendment, but failed of passage in that body. It is now on the House Calendar. The bill provides for a maximum annuity of \$1,200 and for optional retirement after 30 years of service under restricted conditions. As amended by the House committee, the bill also provides for computing the annuities of those already retired under the new method prescribed in the bill which, if enacted into law, will operate to give a substantial increase to most of the annuitants.

It is worthy of note that while several bills were introduced during the last session of Congress, designed to give the benefits of the retirement law to individuals not otherwise entitled under the general law itself, none was enacted.

SCALE OF ANNUITIES

At the close of the fiscal year there were 15,383 annuitants on the roll; of this number 3,302 or about 21.5 per cent were receiving \$999.96 per annum, the maximum allowable under the terms of the law. The annuities are graduated from that figure downward until it is found that one person is receiving an annuity of only \$34.44 per annum. The average for all annuitants on the roll June 30, 1928, was \$733.92 as compared with \$721.39 for the preceding year.

AGES OF ANNUITANTS

The oldest annuitant on the roll June 30, 1928, was over 107 years of age. As shown by his own declaration and by the records of the department where he was last employed, he was born December 25, 1820. One annuitant was 102 years old and one was 100 years; 52 were between 90 and 100, and 1,250 between 80 and 90. The youngest was only 33 years of age.

DISTRIBUTION OF ANNUITANTS

It is a matter of interest to know where the annuitants who have retired from the Government service reside. More live in the District of Columbia than in any single State. New York takes second place and Pennsylvania third. Sixteen live in insular posses-

sions and 55 in foreign countries. Their distribution among the States is as follows:

Alabama.....	111	Montana.....	15
Alaska.....	3	Nebraska.....	156
Arizona.....	23	Nevada.....	5
Arkansas.....	45	New Hampshire.....	142
California.....	880	New Jersey.....	405
Colorado.....	85	New Mexico.....	22
Connecticut.....	149	New York.....	1, 649
Delaware.....	21	North Carolina.....	110
District of Columbia.....	2, 484	North Dakota.....	21
Florida.....	174	Ohio.....	613
Georgia.....	149	Oklahoma.....	65
Idaho.....	3	Oregon.....	69
Illinois.....	844	Pennsylvania.....	1, 153
Indiana.....	328	Rhode Island.....	95
Iowa.....	342	South Carolina.....	71
Kansas.....	245	South Dakota.....	42
Kentucky.....	233	Tennessee.....	203
Louisiana.....	76	Texas.....	190
Maine.....	219	Utah.....	21
Maryland.....	565	Vermont.....	61
Massachusetts.....	823	Virginia.....	636
Michigan.....	358	Washington.....	217
Minnesota.....	353	West Virginia.....	54
Mississippi.....	41	Wisconsin.....	276
Missouri.....	459	Wyoming.....	8

BUREAU OF EDUCATION

Following is the report of the Commissioner of Education:

I have the honor to submit the following report of recent events in public education of the United States, and summary of the operations of the Bureau of Education for the fiscal year ended June 30, 1928, together with recommendations for the extension and improvement of its work, as required by act of Congress approved March 2, 1867.

PRELIMINARY STATEMENT

Two years ago I inaugurated a practice of giving a brief outline of important movements in the field of public education during the year under consideration, in connection with my annual report concerning the activities of the bureau. I shall do the same in the present report. The Bureau of Education is the only agency in the country which gathers complete data and information on a national scale. Therefore, it would seem appropriate that a short analysis of the present condition of American education should be here presented. In my last report I spoke of the hope* that the statistical service of the Bureau of Education might be made more adequate. I am glad to say that this aspiration has been partially realized. In the near future there is every likelihood that statistics of the bureau will be still more complete, accurate, and recent. During the past fiscal year, for the first time in the history of the bureau, so far as I know, most of its statistics were available in the year following collection; that is to say, figures for 1926 were practically all available in 1927.

The State educational officers have become very much interested in the improvement of educational statistics, and largely for this reason have voted to hold a meeting in Washington next December, with the Commissioner of Education. They have asked me to prepare the preliminary data for this meeting, and have indicated that one of its chief objectives should be further improvement of our statistical service. This meeting, which the State educational officers have called of their own initiative, is one of the evidences of the closer cooperation which is coming to the Bureau of Education with educational leaders throughout the country. It argues well for the bureau, and particularly for larger service to the schools of the country.

The functions and organization of the Bureau of Education have been discussed in past annual reports. As these have continued without change during the year no statement with reference to them need be repeated in this report. The policy adopted in my last report of presenting the work of the bureau in topical outline, rather than in details of divisional activities, will be followed.

Summarizing all types of field service during the fiscal year, 22 members of the bureau staff, exclusive of the commissioner, rendered an aggregate of 536 days of field service, outside of the District of Columbia, in 32 different States, Canada, and Cuba. Seven members of the staff, exclusive of the commissioner, delivered 156 addresses in 27 different States, the District of Columbia, Canada, and Cuba, to audiences aggregating 40,530 persons. Forty-nine members of the land-grant college survey staff rendered an aggregate of 740 days of field service in 48 different States.

I. REVIEW OF RECENT EVENTS IN PUBLIC EDUCATION

STATISTICS OF EDUCATION

During the fiscal year bulletins were distributed by the bureau which contain statistics for 1926, showing the activities of public elementary and secondary schools; private elementary and secondary schools, city school systems; public high schools; private high schools; teacher-training institutions; colleges, universities, and professional schools; and a summary of statistics concerning all types of schools. Data were collected and compiled for 1927, showing activities in nurse-training schools; schools and classes for the blind; schools and classes for the deaf; industrial schools for delinquents; and schools and classes for the feeble-minded and subnormal. The collection of statistics for 1928 was begun.

Data collected for 1926 show 20,984,002 pupils enrolled in public and 2,143,100 in private elementary schools, including kindergartens; 3,786,071 in public and 346,054 in private secondary schools; 252,907 in public and 17,209 in private teacher-training institutions; and 280,437 in public and 486,704 in private colleges and universities, excluding preparatory students. The total number of teachers employed in all types of schools is 977,291. The total cost of maintaining and operating these schools is reported as \$2,744,979,689; and the total value of school property is \$8,125,085,472, which amount includes endowments valued at \$1,061,589,042.

The nurse-training schools had 77,768 students in 1927, schools for the blind 6,084, schools for the deaf 84,844, industrial schools for delinquents 84,317, and schools for the feeble-minded and subnormal 104,021.

The total cost of public elementary and high schools in 1903 was \$251,457,625; by 1913 this amount had doubled, being \$521,546,375; by 1920 it had doubled again, \$1,036,151,209; and in 1926 again doubled to \$2,026,308,190. This doubling process promises not to continue indefinitely, since the increase in expenditures has been slowing down during the past two or three years. The cost per pupil in average daily attendance was \$95.17 in 1924, \$98.45 in 1925, and

\$102.05 in 1926. Expenditures per capita of population for these years are \$16.25, \$17.15, and \$17.50.

One factor that affects per capita costs is the change that takes place in the percentage distribution of the age groups in the whole population. Previous to 1890 more than 30 per cent of the population was in the 5 to 17 age group. To-day this group comprises about 25 per cent of the whole population. This means an increasing proportion of adults to support schools. Reduction in the birth rate, and life extension assist in bringing about these changes. In the registration area the birth rate has decreased from 25.1 per thousand in 1915 to 20.4 in 1927. This decrease is beginning to affect the increase in enrollments in the lower grades. Slower growth and a smaller proportion of school children will in time affect school costs. While the general population has increased 87 per cent since 1890, the school population has increased only 62 per cent.

A study was completed concerning the teaching load in typical elementary schools in 79 cities. The replies of 4,000 teachers were tabulated. This study attempts to determine the length of the work day of the teacher, her load as measured in pupil hours, the time allotment of each subject, her time spent in community interests, the academic and the professional training of teachers, the length of her experience, her average annual salary, and the amounts earned outside of regular school hours.

Final reports were received from the committees that were cooperating with the bureau in the revision of a bulletin on uniform records and reports. The material has been edited, prepared as a bulletin, and is now ready for the printer.

A list of accredited high schools has been prepared, and the material is now about ready for the printer. All statistics having to do with negro education have been collected into one bulletin and the material is now in press. A bulletin on the money value of education to the individual has been prepared, and is ready for the printer. A study of acceleration and retardation among 150,000 public elementary school children was undertaken during the year, and the final tabulations are now about completed.

HIGHER EDUCATION

Four matters in the field of higher education seem worthy of comment, although they have not received so much attention in the public prints as have other events and problems.

A recent decision of the courts of Minnesota has helped to clarify the relationship between legislative authority and the governing bodies directly responsible for the administration of State educational institutions. The State Legislature of Minnesota set up a commission of administration and finance, which, in accordance with the law,

exercised powers of control over university finances. This control, if carried to the logical conclusion, would have profoundly modified the educational program of the institution. Since the University of Minnesota is a constitutional body and the powers of the board of regents are defined by the constitution, the act of the legislature in setting up an agency which in effect nullified the rights and powers thus granted was declared unconstitutional. The decision does not prevent proper legislative or State control over public institutions, but insures a professional rather than political development of the educational policies of the university.

The survey of a selected group of college libraries, undertaken under the auspices of the Carnegie Corporation, is important in that it indicates an awakened consciousness of the supreme value of the library in modern methods of college instruction. The report is especially significant with respect to the facts presented concerning the necessary dependence of graduate work upon library resources. Institutional specialization and cooperation in the field of graduate and research work would seem to be made necessary by the very physical limitation of library resources in advanced fields.

The whole problem of graduate work has, during the year, been the subject of much discussion that is, as yet, in a somewhat chaotic state. The administrative organization for graduate schools is being developed satisfactorily; the objectives and limitations of graduate work are not very clearly defined. Since graduate work is so closely related to research, recent tendencies to segregate research work from the standpoint of personnel, finances, and administration are especially significant. Indications in the development of both research and graduate work point to constructive programs which will be revolutionary, in that they will probably substitute orderly procedure for mere ambition to develop.

Little public attention has been given to isolated instances of affiliation of small or junior colleges with larger institutions or with groups of institutions. However, such affiliations have during recent months been effected in sufficiently scattered portions of the United States to indicate that a new method and form of organization is likely to be developed in higher education. In general, it would seem that there is a tendency to set up systems of associated and affiliated institutions for the purpose of perfecting the selective processes of the strongest institutions in the systems, to serve as feeders to advanced work, and to strengthen the faculties and prestige of the weaker elements.

RURAL EDUCATION

Public sentiment has not, for many years at least, been so concerned with the social, economic, and educational conditions of the farm population as in 1928. Attention has thereby been called to the

fact that the educational facilities provided for rural children are generally inferior in quality and scope to those offered in cities, and that not the least important of remediable conditions calling for reform in rural communities are those concerned with supplying adequate educational facilities, elementary and secondary. These facilities apply not only to children, but to adults as well. If our farm population is not satisfactorily solving its economic problems, may not the lack of educational facilities be accountable, in part at least, for the condition? Can increasingly complex problems affecting rural life—social, economic, and recreational—be intelligently solved now or in the future if we continue to be content with a type of education for rural children inferior to that offered urban children in the United States? These and similar considerations have resulted in a demand for equalization of educational opportunity that is more insistent throughout the country than ever before, and definite plans are being formulated on a large scale to effect improvement in the present situation. An outstanding evidence of progress in this direction is the fact that about three-fourths of the States have now established and maintain some type of State equalizing fund, based on the principle that the wealth of the State should be used for the education of the children of the State regardless of their living place, whether on the isolated farms or in the crowded city districts. About one-third of the States in this group have adopted their present equalization plan during the past two years.

Characteristic of progress in rural education during the year is the continued emphasis on scientific study of the state-wide educational situation as a basis for formulating an intelligent plan for the distribution of State funds. During the year several States have inaugurated investigations, results of which will be presented before the coming legislative sessions in the hope of securing intelligent revision of existing methods of school support. New York, Alabama, Arkansas, Pennsylvania, Florida, and Virginia are among the States in which additional State funds have been granted, or changes in the methods of distribution have been made, or contemplated plans have received study and attention during the year.

Newer sources of revenue to relieve the overburdened property taxation as the sole source of school support continue to elicit favorable consideration among States considering the revision of taxing methods. The tobacco tax, which has recently been adopted in four States, is apparently proving satisfactory. It and other types of sales tax are being considered favorably by other States. It seems probable that the next few years will bring substantial changes in sources of revenue utilized for school support.

Arkansas has followed the example set several years ago by North Carolina of establishing by State bond issue a "revolving" or build-

ing fund. This money is lent to districts, generally small rural districts, to assist them in securing suitable school buildings. In some other States in which State aid for buildings is provided some increases in the State funds have been secured during the year. New or enlarged school building services have been set up in a few State departments. Progress in securing better rural school buildings has been accelerated also by school consolidation and by the availability of more definite professional and technical help from State and county school departments.

Efforts toward improvement of the quality of instruction offered in rural schools continue to receive concentrated attention from State and county departments of education. In three States a minimum standard for the lowest grade of teaching certificates of completion of two years of professional work in addition to high-school graduation became effective in the fall of 1927. In at least six States the standard of one year beyond high school became effective, while in several other States improved standards of varying kinds or in varying degrees were effected. Teachers in service and candidates preparing to teach in rural schools have attended professional schools in large numbers during regular and summer sessions held during the year.

The movement for improving preservice and inservice training of teachers for rural schools has received considerable impetus during the past year. The need for coordinating the various functions concerned with teaching service has been pointed out in several recent studies, notably those made in Ohio, North Carolina, and Pennsylvania. These studies show that the lack of coordination among the various functions indicated results in chaos in the teaching situation. Certification requirements and regulations are not coordinated with courses offered in teacher-preparing institutions. There is a lack of harmony between preservice and inservice training provided. Teachers trained for one type of work are employed to do an entirely different type. There is little knowledge of the number of annual replacements for which teachers should be trained by teacher-preparing institutions; of the types of positions for which special training should be offered; of suitable curricula designed to prepare teachers for specialized fields, and the like. Plans for making careful studies of the whole situation or for coordinating the work of the various agencies concerned are getting under way in a few States. Ohio is an example. A State plan for coordination has been worked out during the year under the direction of the State department of education and is well on the way to fulfillment.

In the meantime the number of State teacher-preparing institutions in which rural education courses are established is growing and the quality of the training offered improving. At present 152 of the

185 public normal schools and teachers colleges offer some courses in rural education. There is improvement particularly in entrance requirements, quality of courses offered, and in the opportunities furnished for observation and practice work under rural school conditions. During the year at least six institutions have either established or enlarged and improved departments or divisions of rural education previously established as a regular part of the work offered.

Although the latest available statistics show a larger increase in the number of pupils enrolled in small high schools than ever before, these increases are as yet not keeping pace with the increases in enrollments in the urban high schools. Either because of inaccessibility or because of the failure of the objectives, materials, or methods of instruction now obtaining in these high schools to meet satisfactorily the needs of rural life, these schools are reaching a relatively small proportion of the rural children. Only 25.7 per cent of the children, 15 to 18 years of age, dwelling in rural communities are enrolled in rural high schools; whereas 71.1 per cent of the children of the same age group in urban communities are found in urban high schools. Thus nearly three times as large a proportion of city children go to high school as rural children. Rural dwellers can not hope to compete advantageously with urban dwellers so long as their educational equipment is so generally inferior.

Data compiled during the year show also that rural children who are enrolled in high schools have a much shorter school term than urban children. Ten and nine-tenths per cent of these children attend schools which are in session less than 160 days a year; 76.4 per cent in schools which are open 161-180 days; and only 12.7 per cent in schools open 181 days or more. In the case of urban children, by comparison, 59.4 per cent attend schools in session more than 181 days per year and only 0.3 of 1 per cent in schools open less than 160 days. These differences in the length of the school term for the four years of the high-school period become a significant measure of the more limited high-school opportunities of the rural child.

Another important fact revealed during the year is the failure of the rural high-school curriculum to fit the needs of the rural child. The great majority of rural children are limited in their high-school education to a college preparatory curriculum. Statistics show, however, that only about 20 per cent of the children attending rural high schools go to college. This is a problem of curriculum maladjustment greatly in need of study and improvement.

The junior high school as the immediate unit of centralization, and the senior high school and junior college as a second or third unit are showing growth. The junior high school reorganization as such has not, however, made the rapid progress in rural communities that the advantages offered by it seemed to promise. Thus far only 12 per

cent of the rural high schools have reorganized upon this basis, whereas 47.2 per cent of the urban high-school systems have organized on the junior high school plan.

The consolidation movement in rural schools progressed normally during the year. It is estimated that there were more than 3,000,000 children enrolled in approximately 17,000 consolidated schools in the United States during the school year 1927-28. These statistics do not include many rural high schools which transport pupils, and are, therefore, essentially of the consolidated type.

New causes are constantly appearing which affect consolidation. The junior high school organization involving the advantages of departmentalized instruction is receiving special attention in several States, notably New York and California. In many communities this type of organization brings another year of education within the reach of the children of the local consolidated district; it also tends to improve instruction, to enrich the school program, and enrolls larger proportions of rural children in school.

During the year the Supreme Court of the State of Arkansas rendered a decision of considerable importance, upholding the right of county boards of education to join districts in their respective counties. In Texas 20 counties have availed themselves of a recent law providing State funds for rural high school districts formed by county boards of education under stated conditions. In Alabama a special law enacted during the year consolidated the city and county of Montgomery into one school administrative unit.

Economic conditions in rural areas have not been favorable to increases in the number of supervisors employed in the rural schools. Significant progress in this field in organization and technique is, however, reported. County and other rural superintendents are coming more and more to appreciate the real possibilities of their supervisory functions. They no longer act solely as inspectors, critics, or visitors. Supervisors who are technically trained specialists make scientific analyses of the conditions and problems of the rural schools, and of the needs of the rural teachers, and, with the best available facts at hand, give constructive help of a high professional quality.

An examination of problems discussed by conferences of rural supervisors held during the year indicates that they are attacking such problems as: Teacher attitude and cooperation; improvable factors in teaching skill; teacher failures, their causes and prevention; in-service growth of teachers and principals; the discovery, enumeration, and education of exceptional children; the measuring of pupil progress and achievements; and the development of ways and means of providing for very young and over-age pupils. The significant point is that this work is in an increasing degree based on careful and scientific investigation.

The meager facilities for high-grade reading material in rural schools and communities are being improved through State and county libraries. In 14 States the State library is either a definite part of the State department of public instruction or it is closely affiliated with it. These States are Arkansas, California, Connecticut, Idaho, Maryland, Massachusetts, Minnesota, New York, Ohio, Pennsylvania, Rhode Island, Tennessee, Vermont, and Utah. According to the American Library Association the number of county libraries has increased during the past year from 223 to 260. Some of the States in which new county libraries were established during the year are Indiana, Kentucky, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Texas, Mississippi, and West Virginia.

Progressive tendencies are evident in the State courses of study which have been published during the past year, the most significant of which are (1) the attempt to organize the content of the curriculum around children's needs and activities rather than the adopted textbooks or the traditional subjects; and (2) distribution, by officials in charge, of the work of curriculum construction among representatives of the various educational agencies in the State. Curriculum committees have been composed of specialists in subject matter and in education, of supervisory officials, and, in a few instances, of classroom teachers. Illustrative of the newer tendencies are State courses of study published by West Virginia and Iowa and the work now in progress by state-wide committees in North Dakota and California. In Massachusetts a special course for retarded children was prepared during the year by the State department of education.

CITY SCHOOL SYSTEMS

A few years ago a movement to revise both the elementary and the secondary school curriculums was started. This movement has gained momentum until practically every large city school system and many of the smaller ones are now working on some or all phases of curriculum reorganization. Although great progress has been made in this direction, much more remains to be done. In fact, the curriculum should be in process of revision all the time, and not every 10 or 15 years, so that it may be continually changing to meet the needs of an ever-changing civilization.

Great emphasis is being placed upon civics instruction, especially upon civics as directly related to the child's immediate environment. In many schools a study of the city is made by the children in the lower elementary grades. The National Constitution and the problems in a democracy are being given a prominent place in the secondary-school program.

Character education is receiving much attention, either by direct or by indirect instruction. Some cities have prepared suggested

courses of study and reports upon the subject. For example, the Head Masters' Association of the Boston Public Schools has issued a report on character education in secondary schools, which outlines the aims and objectives in character education and which shows how these aims and objectives may be realized through the school organization. A committee of teachers of Fort Wayne, Ind., has prepared a syllabus for character education in the public schools of that city, the outline being chiefly for use in the elementary school.

The effort, begun several years ago, toward the coordination of the work of the kindergarten and the elementary school continues by the preparation of kindergarten-primary courses of study, by placing the kindergarten and primary grades under the same supervisor, by requiring that new kindergarten teachers be trained in primary-grade methods, and by requiring that primary teachers be trained in kindergarten methods. At a conference of kindergarten and grade supervisors, called by the Commissioner of Education last February, it was the general expression that the work of the kindergarten and the primary grades should be unified through supervision.

That the city schools of the country are attempting to improve the quality of instruction in the elementary schools and to make these schools stand out as prominently as any other unit of the system is evidenced by the fact that the educational and professional standards for elementary-school teachers are being raised in some cities from two to three or even four years of normal-school training. Tulsa, Okla., for instance, is now requiring a bachelor's degree of elementary-school teachers. City normal schools are extending their courses. As an example the normal schools in Washington, D. C., have been added to the list of those which have extended their courses from two to three years. In several States the normal-school courses have extended to three or four years, thus making it possible for the cities in these States to obtain better-trained teachers for their elementary schools.

There is also a tendency to demand increased professional preparation on the part of high-school teachers, and to stimulate those already in service to pursue professional courses. The movement in the direction of requiring a master's degree for academic high-school teachers is also pronounced in many cities.

One of the outstanding movements is the effort to improve the elementary schools through the elementary-school principal. Until rather recently the elementary-school principal was often considered as the managing or clerical head of his school, but now he is being recognized in many school systems as the professional as well as the managing head who is held responsible for results in his school.

The work of the elementary schools, especially of the primary grades, will no doubt be improved as a result of the recent move-

ment to study scientifically children of preschool age and to instruct parents regarding the training of children. Interest in this matter is shown by the increased number of child-study classes, enrollments in university extension courses for parents, demands for reading matter on the care of children, and by the number of national, State, and local conferences on modern parenthood participated in by both teachers and parents. In the elementary-school unit at least eight city-school systems are housing or fully supporting nursery schools.

Possibly no movement in education is being so carefully developed under the guidance of research workers as is the movement to study the preschool child. Child-research centers, supported by private or public funds, have been established in several cities and in some universities. The results obtained from the child-research studies, it is thought, will lead to a better understanding of the emotional nature not only of the preschool child, but of children in the kindergarten and the elementary-school grades as well.

That children should be trained in certain behavior habits, and that their emotional as well as their intellectual nature should be developed, is being recognized as never before. The superintendent of schools of Boston, Mass., for instance, recently appointed a council of teachers to make a report to him on the educability of the emotions. The immediate concern of the council, according to the report, was not with the appreciation of lessons in art, music, and literature nor with the sentiments, but with the urges below the child's mental and physical activities.

One of the significant movements in education during the past few years has been the rapid growth of the platoon or work-study-play plan of school organization in the cities of the country. In 1922, only 33 cities had platoon schools, while in 1928 there are 146 cities in 38 States which have one or more of their schools organized upon the plan, or an increase at the rate of 18 cities a year. Recent reports show that there are over 800 platoon schools in these cities.

Not only is the number of platoon schools increasing, but a nationwide study of platoon schools just completed by the bureau reveals the fact that the curricular content of these schools is being enriched, and that many new and interesting developments are taking place. For example, not only are elementary schools being organized on the platoon plan, but the plan is being adapted to junior and senior high schools. At least nine cities now have either junior or senior high schools operating on the plan.

Another development is the adaptation of the Dalton plan to platoon schools. Experiments in this method of teaching are being carried on in several platoon schools; for example, in the Canton School, Baltimore, Md., the nature study, geography, and history

work in the sixth and seventh grades is being carried on by the Dalton plan, and a very complete record of the results is kept by the teachers.

The use of the auditorium in platoon schools by different groups every period of the day is now well established in this type of school organization. Those engaged in platoon school work contend that the auditorium is one of the most important features of the school, and that some of its values are that it educates children in the desirable use of their leisure time, and serves as a correlating and integrating center for the whole school. It is certainly a new development in the elementary school which is worthy of study, if only as a rather significant experiment in attempting to solve one of the most important problems of our city civilization, i. e., training for leisure-time activities.

The growth of secondary education, which has been one of the outstanding developments in recent years, continues at almost undiminished rate. At the present time more than one-half of the population of high-school age is in actual high-school attendance. The figures for urban as distinct from rural enrollments reveal greater opportunities of high-school attendance offered to city than to rural youth. It is better than an even chance that the city boy of 14 to 17 is in high school; by contrast the probabilities were 7 to 1 against his father having opportunities for a high-school education in 1900.

High-school enrollments have more than doubled since 1920. The extension of secondary education to include in its junior high school some of the grades formerly assigned to elementary schools accounts in some measure for this growth. The larger city school systems are expeditiously placing more and more of their pupils into junior high schools, while the smaller systems are less rapidly but quite consistently also adopting the junior high-school organization. In cities of over 10,000 population between 75,000 and 100,000 pupils are being transferred from elementary schools into junior high schools every year.

Secondary education in some cities is also reaching upward beyond its traditional limit. While the publicly supported junior college is a rather recent development, nevertheless it is beginning to take definite form. The private junior colleges still outnumber the public institutions of this type, but the latter are being organized at a more rapid rate. There are at the present time over 100 junior colleges operated as parts of local school systems. Their number has doubled in the past five years and their enrollments have tripled within the same period of time. The greatest development has taken place in the cities of the West and South, especially in the States of California, Iowa, Texas, Kansas, Michigan, and Minnesota.

Secondary education is becoming exceedingly involved, due to increased enrollments, a multiplicity of types of schools, varied needs and interests of pupils, and the general complexity of demands placed upon the high school by the present-day social order.

Not many years ago our educational system included three units, namely, elementary school, high school, and college. At present there are at least five distinct levels: Elementary school (including kindergarten), junior high school, senior high school, junior college, and college or university (including the professional school). On the secondary-education level the bureau has record of more than 30 different organization types of junior, senior, and junior-senior high schools. If classification is made on the basis of function as well as organization the number of types becomes much more numerous.

In the halcyon days of elementary-high school-college education, we operated on a single-track system which oddly enough provided no stopping facilities for anybody except at the terminus; if a passenger wished to get anywhere he had to agree to take a long trip and to stay with the train. At present our large city secondary schools provide accommodations for all, even for those who do not want to ride. After a certain minimum length of the journey is completed we are called upon to make local stops all along the line for those who wish to go no farther, to furnish express services for those who go to the end of the division, and to supply a limited extra-fast service to those who go to the end of the line and are intent upon making connections at that point.

Each of the units in secondary education is called upon to meet the problems of the pupils who drop out before completion of the course, those who complete but go no farther, and those who complete and wish to continue. This situation involves the solution of problems within each unit, the relationship between the various units, and the articulation with the elementary school at the beginning and with the college at the end of the secondary school period. Through exploratory courses, pupil guidance, special vocational schools, comprehensive high schools, programs for curricular reorganization, and the like, city school systems are at work upon these problems. The whole field of secondary education is, however, greatly in need of coordinated study in order that proper balances may be established in expenditures, administration, and instruction.

PHYSICAL EDUCATION AND SCHOOL HYGIENE

The New York State Commission on Ventilation, in a preliminary report of investigation made in the schools of Syracuse, states that respiratory diseases were much more frequent in children attending

recently constructed schools with forced draft than in old schools in which heat and gravity were the principal factors in air exchange. Following rainy weather there was a striking increase in such diseases in the former schools, due apparently to the more rapid evaporation from wet clothing produced by the greater air motion and consequent chilling of the children. Similar studies in one and two room rural schools of Cattaraugus County, N. Y., confirm previous findings of the commission that "rooms with moderate temperature show lower rates of respiratory illness than do those which are overheated or underheated."

There has been much interest in the possibilities of the use in schools of window glass more permeable to ultraviolet rays than ordinary glass. However, according to Tisdale and Brown, indirect sunlight (sky shine) in the latitude of Toronto passing through special glass is slight or negligible in antirachitic effect, except in the immediate neighborhood of the window, and Doctors Goodman and Green, working in New York City, find that "during the winter months, under the most favorable conditions, very little of the health-giving ultraviolet of the sun can enter even through an open window. When the window is protected by a glass substitute, the amount of ultraviolet entering is still further decreased by the lowered transmission of the glass. Whether by using such a glass substitute sufficient ultraviolet can be introduced to a room during the winter months to be of value as an aid to health, is, in view of present evidence, very doubtful."

Three States—Delaware, Florida, and Ohio—have been added to the list of those having State directors of health and physical education, and a physical education law was passed by Arizona.

A study by Westenberger of the influence of physical defects upon intelligence and school achievement adds another to the investigations which find that this effect is only evident when the defects are serious or of a certain type. The influence of lesser defects is present, but does not show itself in tests which represent only mental work at average school pressure.

An investigation carried out in the dental college of the University of California emphasizes again the importance of the proper feeding of the child, from conception, if he is to have sound teeth. This study suggests that heredity is not so strong a factor in the condition of the teeth as is usually supposed, and that improvement of the diet at school age helps in the prevention of caries.

Investigations by Dean Ruediger and others show anew the neglect of the teaching of physiology and hygiene in secondary schools and in colleges.

A survey recently made jointly by the United States Public Health Service and the Bureau of Education with regard to sex education in high schools shows that there has been a steady increase in the schools giving instruction in this subject. The tendency has been to make it a part of more general courses, such as biology or physiology, and to give less emphasis to disease, and more to the normal personal and social aspects of the subject.

The committee on health and physical education in junior and senior high schools made its report to the department of superintendence, and this was published in the sixth yearbook of the department. It outlines in considerable detail health and physical education programs for junior and senior high schools.

There has been not only complaint of the mismanagement of athletics in high schools and colleges, but efforts are being made to improve present conditions, notably by the State Department of Education of New York.

ADULT EDUCATION

Perhaps the most potent event in the field of adult education during the year has been the publication by Doctor Thorndike and other psychologists, of research studies which show that adults retain their learning ability. Although it was well known that many adults did retain their learning ability, these cases were considered by many people as being exceptional.

There has been a decided growth in the general belief that the average individual retains his ability to learn adequately long after middle age. This is a matter of great significance and is creating a demand that educational programs which have been constructed on the theory hitherto generally accepted, that learning ability for the average individual ceases at maturity, be reorganized. Education is rapidly becoming more vital, and more a part of everyday life, and, as it explains life at every stage of development, it is a continuous process.

It is now becoming evident that public opinion will not long permit millions of our people between the ages of 15 and 50 to remain functionally illiterate for the lack of educational opportunities. This adult illiteracy is not in keeping with our form of government nor with the principles of economy. The offering of elementary educational opportunity to adults pays large returns in the form of increased earnings to the individuals taught and to the people as a whole by the rise of the general welfare.

The theory formerly held by some that fixed habits of adults would prevent them from attending classes even if they had the opportunity to do so is clearly refuted by the large evening-school attendance in

Gary, Ind., Ithaca and Buffalo, N. Y., St. Louis, Mo., Los Angeles, Calif., Johnstown, Pa., Buncombe County, N. C., the rural schools of southern Delaware, and in other places. It has become clearly evident that a certain amount of education is necessary if men and women are to adjust themselves to the ever-changing industrial conditions caused by the introduction of new machinery and the new organization of industry. Those who are studying nonemployment problems hold that education is the best rehabilitating agent to prevent men and women from being thrown out of employment.

The public agency for the formal education of adults is evening and late afternoon schools. There has been shown more interest in evening schools in the past year than during the previous year.

Informal adult education has made notable progress during the year as is seen in the report of the American Library Association, in attendance at museums, and by the increased number of reading and study clubs that have been organized.

Educators are discovering that adults exert the strongest influence in the lives of children, hence the education of parents and other adults is being considered as very important in any program of education.

Parental education throughout the United States during the past year has been characterized by the growing interest of parents in problems that arise in rearing their children and by the tendency toward better cooperation and coordination of existing agencies engaged in one phase or another of parental education; the establishment of more centers for research in child development and parental education in institutions of learning, such as the Ohio State University and the New York State Department of Education; the development of nursery schools in connection with research centers for child welfare and home economics departments of colleges and universities from which parents receive advice and instruction; contributions to research studies made by the publication of child development abstracts, bibliographies, and other publications of the National Research Council; the publication of reliable data developed in other centers of research in child development; and a marked increase in the publication of books by experts on the problems of child development written for the layman in nontechnical language.

Many of the centers for research work in child development and parental education in progress have been made possible through grants by foundations which have also granted funds to several organizations for the promotion of parental education. Among these organizations are the American Association of University Women, whose educational program includes the study of preschool education, the organization of study groups among college-trained mothers, and the publication of materials for organizing and con-

ducting this work; the American Home Economics Association, whose work in child development includes, among other things, the maintenance of a consultant field service, the study of materials available on the subject of child care, and parent education; the Child Study Association of America, located in New York City, which carries on training courses for leaders in parental education, organizes study groups, institutes, and conferences for parents in New York City and in various other cities, and issues publications in connection with its endeavors.

The National Congress of Parents and Teachers, through its national, State, and local bureaus, committees, reading and study groups, works for an educated parenthood and aids individual members in the discovery of educational material which has been made available by experts. This organization conducts annually a nationwide summer round-up of children which is a campaign to have pre-school children examined by experts and to have their remediable physical defects corrected during the summer preceding their first entrance into school. Many Federal and national agencies, educational, medical, and social, have cooperated in this campaign. The instruction of parents in the physical care of their children might be called one of the by-products of this round-up. The National Congress of Parents and Teachers has conducted courses on the "educational aspects of the parent-teacher movement" in many colleges and universities and institutes at normal schools.

Local groups in large cities, such as the Parents' Council of Philadelphia, which during the past year met periodically in many child-study groups for lectures or instruction, and the United Parents' Association of New York City, whose unique feature for the past year was the parents' exposition in New York City, are conducting programs for the education of parents.

An outstanding example of cooperation and coordination is to be found in California, where a state-wide project in parental education has been in progress for a year. The State department of education, the State university, the parent-teacher associations, the department of health, and the county library cooperate for the success of this work under the combined administration of the State department of education and the State university.

INDUSTRIAL EDUCATION

There has been marked progress in the field of industrial education during the past year. An increased interest has been manifested on the part of school superintendents in all phases of the work; industrial companies have been active in their support of plans for cooperating with the public schools in offering training to employed people; and enrollments in general have materially increased, especially in the all-day and part-time classes.

During the year there was a growing recognition of the fact that efficient work can not be carried on without adequate shop rooms and equipment. The housing facilities for shop work and other industrial courses have been improved in many places. New vocational buildings and technical high-school buildings have been erected, additions have been made to present vocational building, and shops have been included in the plans for new high-school buildings. In some sections of the country new gymnasium buildings have included shop rooms in their plans, and have found them satisfactory in operation.

Increased emphasis has been placed upon the values to be derived from the exploratory and developmental types of experiences for the industrial-arts work in the junior high school. A study of the courses offered by various schools, their statement of aims, and their list of projects, together with the discussions of these subjects by teachers' organizations, all point toward a rather general acceptance of these values as the chief objectives for industrial-arts work in the junior-high-school grades. More frequently than in previous years is this work regarded as a part of the general educational program and not a phase of a special type of education. This is as it should be, as it is in keeping with the generally recognized aims of the junior high school.

The past year has also witnessed a considerable increase in the number of local organizations of industrial teachers and a pronounced activity on the part of these organizations directed toward the improvement and promotion of all types of industrial education. These organizations are rendering great service by emphasizing the values of vocational-industrial and industrial-arts courses in the school systems which they serve and by their constructive criticisms of the organization of the courses, methods of teaching, and standards of pupil attainments. The American Vocational Association organized an industrial-arts section which held its first meeting as a part of the program of the annual convention of this association in December, 1927. This association during the past year appointed a committee to make a study of standards for industrial-arts work.

HOME ECONOMICS EDUCATION

Among the significant achievements during the past year in public-school home economics are: Universal home economics curriculum building conforming to the life needs of the girls, in the elementary, junior, and senior high school; the development of courses on the economic and social relationships of the family; extension of home economics for boys; expansion of child development and parental education courses; the increase in the number of nursery schools, day nurseries, and research centers for the observation and study of pre-school children; formation of the Organization of Supervisors and

Teachers of Home Economics, which convened for the first time just preceding the meeting of the Department of Superintendence in Boston, Mass., February 24 and 25, 1928; recognition by school authorities that the school lunch room is an important educational factor of the school system; development of scientific home-economics tests and measurements; studies concerning the gainful occupations open to girls trained in home economics, why girls elect home economics, status of home economics in certain accredited high schools, intelligence quotients of home-economics girls versus those of the girls choosing other academic subjects, grade placement of home-economics subjects, and the administration of home economics in the public schools.

Nine regional cooperative studies concerned with the time allotment and home economics as a required subject in junior high schools, researches on the placement of home economics content in junior and senior high schools, and the administration of home economics in our public-school system, etc., were made by city supervisors of home economics.

COMMERCIAL EDUCATION

The most significant developments in the various levels of commercial education during the past year pertain to research. The research studies were designed to contribute toward a fact basis for the organization of the subject matter and improvement of instruction in the secondary, normal, and collegiate schools. Among the studies reported during the year, the following are outstanding: A comprehensive survey of secondary commercial education in Minnesota; a study of the business biographies of 3,000 graduates from the commercial departments of Iowa high schools; a study of the present status of commercial teacher training; analyses of the work of book-keepers; studies regarding standards for credit in commercial subjects and standards of achievement among office workers; and the research studies reported by the American Association of Collegiate Schools of Business regarding research in business problems. Occupational and follow-up studies were made at a number of universities in Iowa and in many cities, including the following: Oakland, Calif.; Chicago, Ill.; Pittsburgh, Pa.; Minneapolis, Minn.; St. Louis, Mo.; Dayton, Ohio; and Joliet, Ill.

The organizations of commercial teachers have been important factors in the progress of the past year. In accord with the two previous programs of the Iowa Research Conference on Commercial Education, the 1928 program was excellent, consisting of reports on the major research studies. The Eastern Commercial Teachers' Association inaugurated a program of issuing yearbooks. The National Commercial Teachers' Federation began the publication of a quarterly

magazine, and the first award of the Willard J. Wheeler prize for the best research in commercial education was made through the federation. Commercial teachers' associations were organized in the State of Ohio; Philadelphia, Pa.; and New York, N. Y. The National Association of Commercial Teacher Training Institutions held its first meeting at Iowa City, Iowa, in March, 1928.

The outstanding events in commercial teacher training were the announcements regarding this subject by the University of Michigan, University of Pennsylvania, and the State departments of education in California and Ohio. Many universities are studying the need for such curricula and have signified their intentions of entering this field.

Much progress has been made regarding many other phases of commercial education, including supervision, improvement of methods of instruction, organization of clerical training, and retail selling courses.

SCHOOL LEGISLATION

During the past year the legislatures of nine States met in regular session, namely, Kentucky, Louisiana, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, South Carolina, and Virginia. Special sessions were held in Iowa and North Dakota, apparently without enacting any educational legislation.

From the reports received by the bureau it appears that the outstanding feature of educational legislation during the year is not its volume or content but rather its method of procedure. A review of the subject indicates a change in the technique of procedure on the part of various representatives of educational interests seeking legislation. Formerly they generally urged their legislative programs separately, manifesting not only divided interests but occasionally opposing programs, either of which tended to impede legislation.

In recent years school officials, educational associations, institutions, and various organizations interested in education have been inclined to harmonize their interests and to unite in their efforts for desired legislation. Moreover, they have endeavored to prepare jointly, through legislative committees, educational programs to be submitted to the legislatures for their approval and support.

This procedure on the part of the various educational groups appears both effective and appropriate. It is the scientific spirit operating in the field of school legislation, working out programs based upon reports of various committees appointed to study in detail the different problems in need of legislation. Such programs are more and more winning legislative favor. Such committees are being looked upon by legislators as a reliable source of information in regard to matters affecting the schools. There can be no doubt that continued development and use of this procedure will eventually tend to produce more

economic, constructive, and effective school laws, and also to prevent enactment of undesirable ones.

The content of school legislation within the past year is similar in general to that of recent years. Kentucky enacted a State teachers' retirement law, and the legislature of Mississippi appointed a commission to study the question of teacher retirement, while New Jersey and New York made slight changes in their retirement laws. Increased compensation for county superintendents was provided for in Mississippi and New Jersey. A law requiring teachers to be citizens of the United States was passed in New Jersey. The most noticeable changes were witnessed in Virginia, where the school law was recodified and constitutional amendments were made. Constitutional amendments provided that the State board of education consist of seven members appointed by the governor, subject to confirmation by the senate; that the State superintendent of public instruction be appointed in the same manner; and that county superintendents be appointed by the county boards of education from an eligible list approved by the State department. Generally speaking, the tendency of recent years to equalize school funds has not abated, and the problem of securing adequate funds for poor districts still confronts legislators and school officials.

LIBRARY ACTIVITIES

Organized cooperative work by American libraries produced noteworthy results during the past year. The Union List of Serials, showing the holdings in these publications of all the principal libraries of the country, was completed, and a new List of Serial Publications of Foreign Governments owned by the same libraries was inaugurated.

The Library of Congress continued to develop a service which has come to be organic in an institutional way. In addition to an enlarged and intensified service to Congress and to the various Government department, it now renders a diversified aid to scholarship and to libraries as such. The library is now empowered by Congress to receive and administer endowments for specific purposes. Funds recently presented to the library have enabled it to establish "chairs" of various subjects. These are not "chairs" in the university sense, but are interpretive chairs, whose incumbents will combine with administrative duties an active aid and counsel to those pursuing research in the library, and general promotion of research within their fields. These "chairs" are designed to supplement in their respective fields the regular services of the bibliographic and reference sections of the library. Chairs in American history and in the fine arts have recently been established. Archer N. Huntington has given the Library of Congress \$100,000, the entire income of which is to be applied to the purchase of recent publications in the field of Spanish,

Portuguese, and Spanish-American history, art, and literature. John D. Rockefeller, jr., recently gave the Library permission to draw upon him during a 5-year period to the amount of \$450,000 for the acquisition, in reproductions, of source material for American history and of \$250,000 for the extension of bibliographic service.

The union card catalogue of the Library of Congress, which is a record of books in other American libraries that may be useful to research, has been revised and enlarged during the past year so that it now numbers some 4,000,000 cards. This is a cooperative undertaking for public service, and is based upon voluntary contributions of information. Henry C. Folger is to erect a new building on a site immediately adjacent to the Library of Congress to house his great collection of Shakespeariana. This will be another addition to the research facilities of the Library of Congress.

Last year \$750,000 was expended to construct for the Library of Congress a new bookstack to accommodate a million and a half volumes, with special facilities also for the accommodation of research workers. An additional appropriation was also granted to extend the three upper levels of the new stack, and provision was also made for the acquisition of additional ground on which to erect a building auxiliary to the main library building.

With the direct approval of the Pope, three prominent American librarians have been investigating the resources of the Vatican library at Rome with a view to inaugurating measures to make its collections more serviceable to scholars. The plan is to catalogue the numerous incunabula of the Vatican library, to begin cataloguing the manuscripts, and, perhaps, prepare a catalogue of some special section of the library as a pattern for what may ultimately be a complete catalogue of its books. The plan is reported to be making excellent progress. Several representatives of the Vatican library have visited the United States in order to study American library methods at first hand. The scheme is being financed by the Carnegie Endowment for International Peace.

Education for librarianship continues to make notable advances. The new Graduate Library School of the University of Chicago is just opening, and the School of Library Service of Columbia University is making fine progress. The University of Michigan now has a department of library instruction, and the regents of the University of Minnesota have just authorized the establishment of a division of library instruction. Dr. George Alan Works, dean of the Graduate Library School of the University of Chicago, prepared a notable report on college and university library problems, which was published by the American Library Association during the year.

The American Library Association held its fiftieth annual meeting at West Baden, Ind., May 28 to June 2, 1928. One of the principal

features of the meeting was the presence of a delegation of Mexican librarians, headed by the chief of the library department of the Ministry of Education and by the Director of the National Library. Several members of the delegation made addresses which emphasized the note of cooperation between Mexico and the United States in the matter of library service, including especially international bibliography.

Progress in library architecture was made during the year by the erection of noteworthy buildings, among which were that of the California State Library at Sacramento, and public library buildings for Pasadena, Calif.; Birmingham, Ala., and Queensborough, N. Y. Besides the new edifice of Yale University, work was also under way on new buildings for Dartmouth College; Wesleyan University, Middletown, Conn.; the College of the City of New York; and the University of Washington, at Seattle.

II. WORK OF THE BUREAU OF EDUCATION

A. General

1. RESEARCH

(A) Studies Completed

During the year the following studies by members of the staff of the Bureau of Education were brought to completion:

Higher education.—(1) Statistics of land-grant colleges for the year ending June 30, 1926; (2) report on surveys of higher education for 1922–1926; (3) accredited higher institutions; (4) statistics relating to enrollment in engineering schools for 1926–27 and 1927–28; (5) current statistics relating to enrollment, salaries, budgets, etc., of State universities and colleges; (6) self-help in American colleges; (7) statistics relating to student enrollment in land-grant institutions since 1900; (8) statistics of land-grant colleges for the year ending June 30, 1927; (9) study of science and chemistry in college entrance and graduation requirements; and (10) report on income of land-grant colleges since 1900.

Rural education.—(1) Biennial surveys of rural education (teacher preparation and educational surveys); (2) State normal schools and teachers colleges (for whites) in the United States and other institutions reporting courses in rural education and faculty members responsible for the interests of prospective rural-school teachers; (3) consolidation of schools and transportation of pupils for 1925–26; (4) selected list of recent publications of special value for rural-school supervisors; (5) curricula and differentiated courses for the preparation of rural elementary-school teachers offered by State normal schools and teachers colleges (for whites) in the United States; (6)

annotated list of publications helpful to those interested in planning or improving rural-school buildings; (7) selected bibliography of references to recent publications pertaining to rural-school libraries; (8) list of magazine articles helpful to those engaged in the preparation or supervision of teachers for rural schools; (9) bibliography of recent materials dealing with small high schools; (10) abstracts of proceedings of rural teacher-training conference in Boston, February, 1928; (11) abstracts of addresses delivered at the Northeastern Supervisory Conference, New York, N. Y., April, 1928; (12) educational progress among the mountain whites and educational and road conditions in the southern Mountain States; (13) activities of parent-teacher associations in rural communities; (14) State officials responsible for supervision of rural schools; (15) county (and other rural) superintendents; (16) trends of secondary education in Czechoslovakia; (17) museums as a national asset; (18) curriculum construction under direction of county superintendents; (19) criteria for judging rural-school courses of study; (20) State supervision or promotion of libraries for rural schools; (21) cooperation of county libraries with rural schools; (22) elementary teachers' meetings; (23) abstract of certain statistics given in bureau bulletin, "Statistics of Public High Schools, 1925-26," with special implications for rural high schools; and (24) developments in rural-school supervision.

City schools.—(1) Certain practices in city school administration; (2) review of city school survey reports for 1922-1926; (3) supervision by heads of departments in the larger high schools; (4) an evaluation of the schools of Tomahawk, Wis., and of La Crosse, Wis., from data submitted through the extension division of the University of Wisconsin; (5) standing committees of city boards of education; (6) teachers' salaries in cities having a population of 2,500 and over; (7) twelve articles for the United States Daily on various city school problems; (8) administration and organization of nursery schools in the United States; (9) an analytical study of curricula offered for the preparation of nursery, kindergarten, primary teachers, by teacher-training institutions; (10) a primer of information regarding kindergarten education; (11) growth of kindergarten education in public-school systems in cities having a population of 2,500 and over, analyzed by States and by cities according to population size; (12) annotated list of pamphlets on early childhood education, issued by schools and professional organizations; (13) child study material for parents grouped to help parents guide their children's growth and play activities; (14) publications in the field of kindergarten-primary education—a classified and annotated list of references on the history, current practice, and scientific investigations in kindergarten-primary education; (15) projects and curriculum materials on safety instruction for the elementary schools; (16) source material on different phases of

the platoon plan of school organization; and (17) requirements for high-school graduation in States, cities, and individual schools.

Physical education and school hygiene.—(1) Present status of school health work in the United States; (2) posture of school children; (3) methods of organizing health work in rural schools; (4) administration of physical education in the public schools; (5) professional courses for teachers of physical education; (6) study of State athletic associations for control of high-school interscholastic athletics for boys and for girls.

Adult education.—(1) Opportunities offered for adults to further their education through college and university extension; (2) effective methods of teaching adult alien and adult native illiterates; (3) educational opportunities offered to adults in Denver, Colo.; and (4) charts, showing age, previous occupation, and education of inmates of Oregon State Penitentiary and school subjects wanted by them.

Industrial education.—(1) List of private and endowed schools offering trade and industrial courses, with a short descriptive account of each school; (2) study of the general shop, dealing with organization, courses of study, buildings, and equipment; (3) study of grading the work of pupils in industrial schools and classes; (4) study of the use of tests and measurements in industrial schools; and (5) industrial teacher-training and industrial courses in land-grant colleges.

Home economics education.—(1) Study concerning the election of home economics in senior and regular high schools of representative cities of the United States; and (2) study concerning time allotment and requirements of home economics courses and subjects taught in the junior high schools.

Commercial education.—(1) Need for supervision of commercial education; (2) follow-up and commercial occupation surveys; (3) status and trends of commercial education in junior high schools; (4) city and State standards for credit in shorthand and typewriting; (5) reports on research pertaining to bookkeeping, stenography, and commercial teacher training; (6) commercial teacher training in normal schools and teachers' colleges; (7) collegiate education for foreign trade; (8) evening collegiate courses in business; (9) tests and measurements in commercial education; and (10) private and endowed schools for negroes, offering education and training for business.

School legislation.—(1) Analysis of State laws relating to compulsory education; (2) statistics showing relation between compulsory education laws and illiteracy of persons 10 to 25 years of age in the United States in 1890 and 1920; (3) digest of legislation for the education of crippled children; (4) legal status and current practice in regard to the Bible in the public schools; (5) digest, by States, of 1927 educational legislation; and (6) digest of State laws relating to the teaching of the effect of alcohol and narcotics.

Foreign education.—(1) Illiteracy in the various countries of the world; (2) major trends in education in foreign countries; and (3) practical program of education for promotion of international good will.

(B) *Studies in Progress*

Higher education.—(1) Statistics of land-grant colleges for the year ending June 30, 1928; (2) extension work in teachers colleges; and (3) study on fellowships and scholarships.

Rural education.—(1) Achievement of pupils in consolidated and one-room rural schools; (2) plans for the administration of transportation in selected consolidated schools; (3) trends of salaries of teachers in rural schools between the years 1922 and 1926; (4) statistical and analytical study of rural high schools; (5) a curriculum unit based upon plans for a play day; (6) curriculum unit based upon activities intended to stimulate and develop children's interest in nature; and (7) distribution, qualifications, and duties of rural-school supervisors.

City schools.—(1) How the school-building problem is being solved in the United States; (2) the platoon plan in 135 cities in 36 States; (3) individual instruction in platoon schools; (4) the auditorium in platoon schools; (5) types and extent of devices for adapting secondary schools to the individual differences of pupils; (6) the educational value of building blocks in nursery schools, kindergartens, and primary grades; (7) supervision for the kindergarten and primary grades of city-school systems; (8) revision of reading course for parents; (9) chapter on city-school systems, for the biennial survey, 1926-28; (10) progress in schoolhouse construction for the biennium 1926-28; (11) a review of city-school survey reports for 1926-28; (12) progress in nursery, kindergarten, primary education in the United States; (13) progress in secondary education; (14) methods of selecting new teachers in city schools; and (15) a series of lesson projects on the American Indian for use in the elementary school.

Physical education and school hygiene.—(1) Physical defects of school children and what can and should be done about them; (2) sanitation of the schoolroom; (3) open-air schools and their management; (4) physical education as a required subject in teacher-training schools; and (5) best methods of construction for rural schools.

Adult education.—(1) Best methods of reducing illiteracy in the United States, with special attention to means of promoting the organization of evening schools in both city and country districts; (2) various types of part-time education in the United States; (3) contributions of various national organizations toward the reduction of illiteracy in the United States; (4) extension activities in teachers' colleges and normal schools; (5) educational opportunities offered to inmates of prisons in the United States; (6) educational opportunities

offered to adults in rural communities in Delaware; (7) extension activities in land-grant colleges; (8) campaigns to prepare children for their first entrance into school, free from remediable defects; (9) courses in home education for reading or study by individuals or groups.

Industrial education.—(1) Part-time work in industrial education; (2) survey of courses for manual-arts teachers offered in teacher-training institutions; (3) survey of progress in industrial education for the biennium 1926–1928; and (4) list of supplementary reading material for industrial schools and classes.

Home economics education.—(1) Home economics for boys and men; (2) home economics in the one-room rural schools and consolidated rural districts; and (3) nutrition as taught in the public schools of the Nation.

Commercial education.—(1) Part-time commercial education; (2) collegiate education for business; and (3) commercial teacher training and education for business in land-grant colleges.

School legislation.—(1) Review of 1926 and 1927 educational legislation; and (2) legislation for financing education, showing sources of school funds and methods of distribution.

Foreign education.—(1) Ministries of education in foreign countries; (2) bilingual and multilingual school system 5; (3) foreign students in land-grant colleges; and (4) education in Argentina.

2. EDUCATIONAL SURVEYS

Educational surveys constitute an important function of the Bureau of Education. In March, 1927, the bureau undertook a resurvey of negro colleges and universities in the United States. The report has been completed and is now in process of publication. The survey shows the remarkable gains made in the development of institutions of higher learning for negroes in the past 10 years, and the need for even greater development of colleges and universities in order that the needs of the race may be fully met.

The work of the survey of the land-grant colleges was begun in July, 1927, when the funds appropriated by Congress became available. Rapid progress has been made. Large numbers of persons are actively participating in this survey as members of local committees and of the field staff. Many of the questionnaires have been prepared and distributed to the colleges for final filling out. The bureau's field staffs to handle four of the questionnaires have been organized and their members have commenced to make visits to the institutions.

An investigation of possibilities for the establishment of courses in rural education in Miami University, Ohio, was made.

The bureau is cooperating with the Office of Indian Affairs of the Department of the Interior in a survey of Indian educational con-

ditions and revision of the course of study for Indian schools. Several days preliminary field work have been devoted to this endeavor.

The State superintendents of public instruction and commissioners of education during the fiscal year decided to hold a two-day conference in Washington in December, 1928, with the Federal Commissioner of Education. One of the problems which they propose to discuss is the support and financing of schools. In view of the fact that the costs of public schools have more than doubled in the past few years, it seems that such a study would be highly serviceable to the cause of education; measures might be formulated in the interest of economy that would prove most efficacious. This whole field is relatively unexplored. Every conceivable form of taxation is used in the effort to support schools. No one has attempted to show the most satisfactory ways of raising funds for school purposes. A sound and economic program for expenditures is equally as important as a proper system of revenue. These and other studies ought to be made as quickly as funds are available.

3. CONFERENCES

The following conferences were called by the Commissioner of Education:

Conference on rural-teacher preparation, held in Boston, January 25, 1928.

Conference of State and local supervisors of rural schools in the Northeastern States, held in New York City, April 23 and 24, 1928.

Conference on rural-teacher preparation, held in Los Angeles, Calif., June 14-18, 1928.

Conference of kindergarten-elementary grade supervisors in city school systems, held in Boston, January, 1928.

The third national conference of home economics supervisors, which was held in connection with the twenty-first annual meeting of the American Home Economics Association in Des Moines, Iowa, June 25, 1928.

The bureau also cooperated with the National Platoon School Organization in holding a series of committee conferences in Boston during the meeting of the department of superintendence.

4. COOPERATIVE UNDERTAKINGS OTHER THAN CONFERENCES

Cooperation with other organized educational agencies is emphasized by the Bureau of Education. During the fiscal year cooperation was inaugurated with local, State, and national organizations interested in reducing illiteracy. A plan for cooperation between the bureau and the United States Bureau of Naturalization regarding the preparation of aliens for citizenship in the United States was formulated.

Cooperation was effected with the United States Department of Justice in devising an educational program for Federal penal and correctional institutions. During the year this cooperation has included conferences with officials of the Department of Justice in Washington, D. C., and preliminary plans for visits to institutions in the early part of the fiscal year 1928-29.

The bureau cooperated with the American Library Association, the National University Extension Association, and the National Congress of Parents and Teachers, in connection with the national committee on home education, of which the United States Commissioner of Education is chairman. The third meeting of this committee was held on April 6, 1928, at Washington, D. C., at which a general plan of cooperation between these agencies and the Bureau of Education was formulated.

Cooperation with the National Congress of Parents and Teachers in the summer round-up of children was continued during the past year, by urging the increased participation of 19,000 school officials in this campaign to prepare children for entrance into school free from remedial defects.

Cooperation was had with the following committees of the National Education Association: (a) Committee on coordination in adult education; (b) committee interested in posters for use in adult classes; and (c) commission on the articulation of the units of the American school system.

Cooperation was also maintained by the bureau with the Rural Life Bureau of the National Congress of Parents and Teachers, American Vocational Association, Negro Land-Grant College Association, United States Department of Commerce, etc. Cooperation was effected with several city school systems in examination of their home-economic courses of study, with a view to suggesting improvements; and with the Board of Education of Dallas, Tex., in formulating plans for a new technical high school.

The bureau cooperated with the national nursery school committee and with a subcommittee, in developing a tentative list of minimum essentials for nursery-school education, the purpose of which is to show educational objectives underlying this work and to set up standards by which the rapidly increasing number of preschool classes can be grouped as nursery schools, or as informally organized play groups.

During the past year the bureau assisted in establishing the Washington Child Research Center. The bureau representative acted on the housing and teacher appointment committees and was put in charge of the work of reconstructing the building and equipping it for the research center. Cooperation with this center gives the Bureau of Education an opportunity to study phases of child development and parental education at first hand.

The bureau cooperated with 10 national research committees on the platoon plan. It also cooperated with the District of Columbia Parent-Teacher Association by erecting a school building exhibit of 100 mounts in the main corridor of the Department of the Interior Building; with the department of rural education of the National Education Association, American Country Life Association, Southern Women's Educational Alliance, National Fire Waste Council (agricultural committee); and with the venereal disease division of the Public Health Service in making a survey of the teaching of sex hygiene in high schools.

5. MISCELLANEOUS

The credentials of 307 foreign students from 53 different countries were evaluated.

Translations were made, for the bureau, of educational material from 17 different foreign languages, a total of 50,500 words. In addition, service was rendered to governmental agencies, outside of the bureau, in the translation of material from 17 different foreign languages, a total of 39,360 words.

A member of the bureau staff served as secretary of the commission on education of the World Conference on International Justice, Cleveland, Ohio, May 7-11, 1928.

The bureau was represented at the Fifth Pan-American Child Congress held in Habana in the fall of 1927. Its representative delivered an address before the congress and spoke before three local organizations. An exhibit was prepared by the bureau to show activities in nursery-school, kindergarten, and primary grades.

The following additions were made to the visual material available for distribution: 900 feet of film showing nursery-school activities, a reprint from pictures taken in the Oregon Agricultural College; and 163 colored stereopticon slides of activities in nursery schools, kindergarten, and primary grades.

The bureau collected an art exhibit from several of the city school systems of the country for the executive committee of the Imperial School Children's Association in Japan, to be used in connection with an art exhibit in that country. An exhibit of art by Japanese school children was received and sent to the cities that contributed to the exhibit for Japan.

A directory of 828 supervisors of kindergarten-elementary grades in the city school systems of the country was compiled.

B. Home Education

During the past fiscal year the work of home education has been largely reorganized. Projects to be carried on in home education include: Studies of various phases of parental education and of move-

ments related to the education of parents in groups or individually; the preparation of materials for the home education of the whole family, such as courses, lists of books, circular letters, bulletins, reports, and other publications in connection with the work; making contacts with individuals, groups, institutions, and agencies for the promotion of home education; a consulting and advisory service for parents, for leaders in the organization of parent groups, and others interested in pursuing their own education at home.

The enrollment and certificate features of the bureau's reading courses were discontinued November 15, 1927. For the 5,997 readers already enrolled for courses the bureau will continue the service for three years following the date of each enrollment up to November 15, 1930. The total enrollment for reading courses since the beginning of this project reaches almost to 30,000 readers. During the past year 402 certificates were issued.

New reading courses have been prepared on home training of children, the whole child, and problems in adolescence for parents. Revisions have been made on the courses: World's great literary bibles; Great literature, ancient, medieval, and modern; Agriculture and country life; Citizenship and government; The preschool child; Forty books for boys and girls. To all of these courses new features have been added.

There are now in process of preparation courses on Transportation, Parent-teacher associations, Art, Nature study, and revisions of other courses.

C. *Alaska*

The only purely administrative functions of the Bureau of Education are in connection with its work for the benefit of the natives of Alaska. This work comprises the education, medical relief, and the promotion of industries, including the herding of reindeer, of the native Alaskans.

The organization of the Alaska division of the bureau consists of the Washington, D. C., office, with 3 employees; the Seattle, Wash., office, which is the headquarters of the Chief of the Alaska Division and functions as the purchasing and disbursing office for the bureau's Alaskan work, with 7 employees; and the field force in Alaska, which, during the fiscal year 1927-28, included 6 superintendents, 177 teachers, 9 physicians, 28 nurses, 3 employees in connection with the reindeer service, 17 employees on the U. S. S. *Boxer* and on the Yukon River medical boat; also 19 cooks, janitors, and orderlies, a total of 269 employees. Ninety-five schools were maintained with an enrollment of 3,742.

It is interesting to compare the condition of the Alaskan natives to-day with that of the past. When the activities of the Bureau of

Education began in Alaska 44 years ago the Eskimos were in a state of barbarism, with no written language, living in winter in wretched hovels, half underground, and in rudely constructed tents or shelters of skins in summer. There are now many villages in which are cooperative stores owned by the natives, churches, community halls, and comfortable homes with electric lights and heaters. Forty years ago the natives in many parts of Alaska were catching their game with snares made of sealskin or sinew; spearing fish with spears tipped with flint, jade, or bone; and were fishing with nets made of willow roots. These crude implements were not efficient, and whenever the supply of game was scarce, starvation was inevitable. Poor living conditions and an uncertain and ever-limited food supply made the people an easy prey to disease. Statements have been made that there are more deaths than births among the Indians and Eskimos. Statistics gathered from nearly all the villages in all parts of Alaska show that under the improved health conditions the native population is increasing. The births exceed the deaths. The natives are rapidly developing into valuable citizens who will play an important part in the future development of Alaska. Many of the native Alaskans are making good as reindeer men, sailors, engineers, sawmill men, carpenters, mine laborers, teachers, cooks, orderlies, nurses, and in other lines of activity.

Industrial education.—In each of the 95 schools instruction is given in the usual subjects of the common schools; also such industrial training as supplies at hand and local conditions permit. Sewing and cooking are taught in most of the schools, and carpenter work is limited only by the quarters and lumber available. In some of the schools the girls bought flour and other groceries at the native store, which they baked into bread, biscuits, cookies, gingersnaps, pilot bread, doughnuts, and cakes, some of which they sold to the native store. Sometimes reindeer skins were bought from which they made boots, parkas, socks, and mittens, some of which were sold and the proceeds used in buying from the store cloth, needles, thread, and other sewing supplies. In the schools the girls receive instruction in tanning and sewing skins, simple dressmaking, and in general cooking and baking. At some villages berries were brought to school by the children and made into jelly; flour was brought and made into bread; yarn was brought and made into mittens and caps. Utilization of local talent and materials is encouraged. In addition to this industrial work, which is always stressed, each school has done classroom work that would compare favorably with that of the rural schools of the States.

The work of the schools is closely related to the village life. The school republic becomes the village council; the school gardens become the village gardens; the girls in the cooking class become the

bread bakers for the village; the clean-up of the school grounds becomes the village clean-up; the teacher of physiology and hygiene becomes the sanitary engineer for the village; and the schoolboy, who is sent to the reindeer herd as an apprentice, in four years becomes the owner of a herd, the supporter of his family, and a future leader of his people.

Industrial boarding schools.—Three industrial schools, located, respectively, at White Mountain near Golovin on Norton Sound; at Kakanak on Bristol Bay; and at Eklutna on Cooks Inlet, north of Anchorage on the Alaska Railroad, have been constructed, organized, and equipped; they were opened for the reception of pupils on September 1, 1925, as boarding schools. The purpose of these schools is to offer native boys and girls specialized instruction of an industrial nature for which the ordinary day school is not equipped, and to give training, encouragement, and help to exceptional young people that they may better cope with the peculiar conditions under which they live and render service to their own people by pointing out better ways to utilize the natural resources, to build better homes and communities, and to live fuller, richer, and happier lives.

The aim of the Bureau of Education is to prepare the native boys and girls to make the best living possible in an Alaskan way in Alaska. The three industrial schools are located in strategic points, covering all sections of the Territory except the southeast, where a new school is planned. Emphasis is placed on the promotion of native industries, health and sanitation, and morality in addition to the elementary subjects usually taught. Utilization of Alaska's food supply is an important part of the courses. The boys study problems in connection with the reindeer industry, methods of preparing reindeer meat for cold storage and for the market, cannery processes of the fishing industry, and the growing of vegetables and fruits. A tannery course includes the curing of skins for use as fur clothing and for leather. The boys are taught to carve ivory for use as buttons, beads, carving sets, and handles for knives and forks. Special consideration is given to the tailoring of native fur and leather garments. Standard elementary instruction in commercial work is designed to train the natives as typists, stenographers, clerks, and managers of cooperative stores. Because of the urgent need of better housing conditions among Alaskans, carpentry courses are considered especially important. Directed play includes primitive games as well as basket ball, baseball, and tennis.

During the fiscal year five new schools were established and new buildings provided at Chitina, Chanega, Old Harbor, Kashega, and Koyuk, at a cost of \$4,000 for each building.

To four Alaska natives falls the honor of receiving the first diplomas from the Bureau of Education for completing the industrial courses at the White Mountain School in northwestern Alaska, on Norton Sound. Isaac Newlin and his wife, Jennie Newlin, Josephine Kalarak, and Roger Menadelook were the first to complete the school's grammar and industrial courses. The young men and women received their seventh and eighth grade instruction at White Mountain and pursued practical courses in Alaskan industries. The presentation of the diplomas was a big event for all of the 53 native boarding pupils drawn to the school from villages along the coast from Point Barrow, the northernmost extremity of Alaska, to points south of the Yukon River.

When viewed over a term of years, the accomplishments of the Bureau of Education and the resultant development of these natives are most gratifying. In the same home one can see men and women used to a mode of existence of the old stone-age type living comfortably with their children and grandchildren and enjoying the conveniences of a twentieth century civilization.

Disastrous fires.—On January 18, 1928, the two-room school and teacherage at Barrow, erected in 1903-4 at a cost of \$6,600 for materials, was destroyed by fire with all school supplies and personal effects of the teachers. Nothing was saved except the coal, gasoline, and coal oil stored in an adjacent building. The teachers and natives met the situation, borrowed from the school at Wainwright, more than 100 miles distant, and transported by dog sleds, supplies, books, and equipment, and reopened school in a storeroom. Congress promptly made an emergency appropriation of \$16,000 for the erection of a new building and the purchase of supplies and equipment.

The night of April 1, 1928, a fire of unknown origin destroyed the 2-room log school building at White Mountain. Books, equipment, most of the records, the weekly laundry of the boarding pupils, and a quantity of foodstuffs stored in the building were destroyed. The building was erected a number of years ago as a station school, long before the industrial school was established. Congress made an appropriation of \$60,000 for a modern building with equipment and to provide a river power boat and storehouse at Golovin.

On June 8, 1928, the school at Killisnoo, an Indian village on Chatham Straits, in southeastern Alaska, was destroyed by a fire that burned practically the entire village. Congress had adjourned and no money is available with which to provide a school for the natives, most of whom have moved to Angoon, a near-by Indian village.

Kanakanak boys' dormitory.—In the fall of 1927 the Combined Packers' Association deposited at Kanakanak, in southwestern Alaska, lumber, with plans and specifications for a boys' dormitory at Kanakanak Industrial School. By special legislation the Secretary of the Interior was empowered to officially accept this gift.

Frank H. Warren, president of the Portland Packers' Association, arranged for the packers to send carpenters to Bristol Bay on the May boats, along with the cannery crews, to construct the building, so that it might be ready for occupancy by July 20, 1928. The following companies participated in the gift: Nakat Packing Corporation, Seattle; Nanek Packing Co., San Francisco; Bristol Bay Packing Co., San Francisco; International Packing Corporation, Seattle; Alaska Salmon Co., San Francisco; Red Salmon Canning Co., San Francisco; Northwestern Fisheries Co., Seattle; Columbia River Packers' Association, Astoria; Libby, McNeill & Libby, Seattle; Portland Packers' Association, Portland; The Alaska Packers' Association, San Francisco.

Educational statistics.—The following table is a summary of school statistics:

Educational statistics for the school year ending June 30, 1928

Total number of days in actual attendance.....	397, 829. 00
Total number of pupils enrolled during the year.....	3, 742. 00
Average daily attendance throughout the year.....	2, 718. 11
Percentage of attendance.....	94. 41
Average number in schoolroom each day.....	29. 94
Total number of schools open.....	95. 00
Total number of schoolrooms open.....	158. 00
Average number of days in school year.....	140. 29
During the year there was spent for repairs on the school buildings and not counted as a part of the operation of the school.....	\$15, 170. 00
Spent for new buildings.....	16, 380. 00

Community service statistics

District	Visits made to homes	Medical assist- ance rendered	Number births reported	Number deaths reported	Native popula- tion	Number of teachers reporting
Central.....	2, 901	4, 701	60	43	1, 898	32
Northwestern.....	2, 889	3, 394	61	34	2, 260	22
Seward Peninsula.....	4, 636	4, 633	59	15	2, 142	29
Southeastern.....	3, 343	5, 192	104	168	4, 784	39
Southwestern.....	1, 963	3, 544	34	40	1, 417	28
Western.....	3, 666	6, 306	45	41	2, 020	27
Total.....	19, 398	27, 770	363	341	14, 521	177

Medical relief.—To provide for the medical and sanitary relief of the Eskimos, Aleuts, Indians, and other natives of Alaska, the Bureau of Education employed in Alaska during the fiscal year, 9 physicians, 24 nurses, 6 cooks, and 4 pupil nurses. Hospitals were maintained at Juneau, Tanana, Akiak, Kanakanak, and Noorvik. Contracts were entered into with hospitals at Nome, Anchorage, and Cordova in Alaska, as well as with other hospitals in the States of Washington and Oregon, for the treatment of Alaskan natives.

A large number of native boys and girls were brought to Seattle for special treatment and delicate operations. The service rendered in Alaska during the fiscal year is shown in the following table:

Statistics of medical service by doctors and nurses

	Nurses	Doctors	Total
Number of visits to homes.....	8,725	201	8,926
Number of patients treated.....	11,304	5,150	16,454
Number of treatments given.....	31,286	20,659	51,945
Number of births reported.....	124	39	163
Number of deaths reported.....	128	30	158
Total days of hospital care.....	655	14,601	15,256
Out and clinic patients.....	657	3,988	4,645
Out and clinic calls.....	10,052	6,399	16,451

There has been no expansion of the medical service among the natives during the fiscal year other than to station a nurse at Shishmaref on the upper Seward Peninsula, and to make some improvements in the hospital at Tanana.

The Yukon medical boat was again operated during the season. During the summer of 1927, it was in charge of Dr. John Huston, detailed from our Juneau hospital, who was assisted by two trained nurses. The boat went into operation at Nenana on June 1, 1927, and its work was very successful during the early summer. Unfortunately, Doctor Huston fell overboard on July 16 and was drowned. After his death the two nurses continued to treat all cases along the river that required medical attention. During the cruise of the boat, upwards of 1,473 patients were treated and much dental work accomplished, including 884 extractions.

During the spring of 1928 repairs were made on the engines of the boat, which went into commission at Nenana, June 8, 1928, with a doctor, dentist, and two nurses. It arrived at Tanana on June 11, and went up the Yukon River for the earl summer, planning to visit the lower river during July, August, and September.

The U. S. S. Boxer.—The *Boxer* left on its third voyage of the season on July 20, 1927, with 14 passengers and a full cargo of supplies for distribution to stations on the shores of Bering Sea and the Arctic Ocean. It returned to Seattle in December with 500 reindeer carcasses from Point Hope, Kivalina, Kotzebue, and Wales. On May 7, 1928, the *Boxer* left Seattle with a full cargo of supplies and 5 teachers for the lower Kuskokwim River, Hooper Bay, Nunivak Island, Nelson Island, and St. Lawrence Island. With the usual cargo was a building for the new school at Egegik and considerable equipment for the Kanakanak Industrial School, including lighting plant, laundry, and heating plant for the boys' dormitory building, donated by the Combined Alaska Packers' Association.

Reindeer in Alaska.—The reindeer industry is no longer an experiment although still in its infancy. It is estimated that there are

400,000 square miles of barren tundra in Alaska, and everywhere on this broad expanse the reindeer can find the long, fibrous, white moss which is its food. Many estimates have been made of the number of reindeer in Alaska and their distribution. During the fiscal year a count has been completed and the following is the tabulation of the reports made of the count by the district superintendents:

District	Deer owned by Government	Deer owned by natives	Deer owned by white men	Total
Seward Peninsula.....	2, 217	86, 476	42, 511	131, 204
Northwestern.....		116, 000	14, 000	130, 000
Western.....	2, 614	30, 624	18, 131	51, 369
Southwestern.....	695	7, 603		8, 298
Central.....		245		245
Total.....	5, 526	240, 948	74, 642	321, 116

The reindeer of the natives are largely owned by cooperative associations organized by the natives, as is shown by the following table:

Name	Location	Estimated number of reindeer
Farthest North Reindeer Co.....	Barrow.....	12, 000
Wainwright Reindeer Co.....	Wainwright.....	9, 732
Point Hope Reindeer Co.....	Point Hope.....	4, 100
Kivalina Reindeer Co.....	Kivalina.....	13, 913
Kotzebue Reindeer Co.....	Kotzebue.....	7, 000
Noorvik Reindeer Co.....	Noorvik.....	5, 000
Selawik Reindeer Co.....	Selawik.....	6, 000
Deering Reindeer Co.....	Deering.....	6, 000
Buckland Reindeer Co.....	Buckland.....	18, 000
Cape Reindeer Co.....	Wales.....	18, 000
Reindeer Commercial Co.....	Gambell.....	8, 000
Do.....	Sevoonga.....	12, 000
Alitak Reindeer Co.....	Alitak.....	245
Council Reindeer Association.....	Council.....	8, 000
Kuskokwim Reindeer & Trading Co.....	Akiak.....	30, 000
Total.....		157, 990

Provision was made in the appropriation for the fiscal year 1929 for a supervisor of the entire reindeer service.

D. Library

The major project carried on by the library division during the past year has been the collection and organization of information regarding research studies in education, both those in progress and those recently completed, conducted by various agencies throughout the country. This service was undertaken in answer to repeated requests that the Bureau of Education should render it. For this purpose letters and report-form cards were sent to all known agencies and institutions in the United States engaged in educational research, requesting reports of studies under way and of those completed during the year 1926-27. Large returns to this request have been received, both in the

way of reports of studies and in copies of the studies themselves, which were sent when available. All this material has been edited, classified, and placed on file for consultation in the library. Two mimeographed bibliographies of research studies in progress, 1927-28, were prepared and distributed in March and May, 1928, respectively. A bibliography of research studies in education was also prepared for printing as a bulletin; it was completed during the year ended June 30, 1928. All these research bibliographies are annotated and equipped with indexes and cross references. Abstracts of many of the studies were supplied by the authors or agencies reporting them, others were annotated by various specialists of the bureau, and the final editing for publication was done by the library division. A beginning was also made in compiling a bibliography, to be published later, of research studies in education completed during 1927-28. During several months an assistant educationist was temporarily employed to aid in the research information service.

The other bibliographical and reference service of the library has continued unabated during the year. The lists of references, either typewritten, mimeographed, or printed, were in great demand and were extensively circulated. Bibliographies on Education for Citizenship, and on Play and Recreation were prepared for printing as library leaflets. Copy for a new library leaflet on Higher Education was also prepared. The final issue for 1927 of the Record of Current Educational Publications was provided with an index for the entire year and prepared for printing, the earlier issues having been already published.

The reading room of the library was increasingly used by students of education and by investigators during the past year. A large number of volumes were lent to borrowers both within and outside Washington.

The library continued its growth by numerous accessions. It added largely to its files of publications of State and city departments of education, and it established a new complete file of current catalogues and reports of American colleges and universities.

Cooperation with the Library of Congress was continued by supplying copy for printed catalogue cards for educational books, in the series supplied by the card division of that library. The library also handled a large amount of correspondence, and attended to the binding of periodicals and serials.

E. Publications

Publications of the Bureau of Education in the fiscal year of 1928 consisted predominantly of papers for the biennial survey of education. Thirty-two bulletins were issued; 16 of them were chapters of the biennial survey; and 8 of the 16 were of statistics. In extent

and expense the eight constituted the most important class of publications of the year.

The whole number of documents printed in the year ending June 30, 1928, was 68, of which 32 were bulletins, 11 leaflets and circulars, 1 report of the Commissioner of Education, 10 numbers of School Life, 12 numbers of the clip sheet, and 2 miscellaneous publications.

The allotment of funds for printing was less by \$3,000 than in 1927, and the total output of printed matter was less by 26 documents than in the previous year.

With lessened appropriations further decrease was necessary in the extent of the individual documents and in the size of the editions. The average number of pages per bulletin was less by 32.2 in 1928 than in 1927. Thirty manuscripts prepared by members of the staff of the Bureau of Education were in the files of the editorial division awaiting publication at the end of the year. They could not be printed promptly after their completion because no money was available.

The Bureau of Education is fortunate in having an able and productive staff; but the country does not have the full benefit of their labors, because the sums required for publishing the results of their investigations are not provided.

F. Activities of the Commissioner

During the fiscal year just closed the Commissioner of Education traveled 39,099 miles in rendering service in the field. The expense for this service was borne almost entirely by those to whom service was rendered. He made a total of 94 addresses before various National, State, and local organizations, before audiences aggregating 89,705 persons without estimating radio listeners. He published 17 articles bearing upon educational matters. There were the usual number of conferences and interviews in the office in Washington and in connection with field trips.

G. Recommendations

(1) Recommendations which I have made in past reports with reference to the enlargement and activities of the Bureau of Education need not be repeated here, but it is well to emphasize the increasing need of research in the field of education on a comprehensive basis such as no other agency aside from the Bureau of Education is in a position to perform. Perhaps this purpose may be served by the organization of a number of successive studies national in scope, with definite objectives and limited in time, for which specific appropriations may be asked. I have in mind a series of studies similar to the survey of the land-grant colleges and universities, which is now in progress. In the preliminary estimates now under consideration by the Bureau of the Budget, we have included an estimate of \$50,000

to begin a study of secondary education, to be followed in successive years by appropriations of \$75,000 and \$100,000, respectively. Two hundred and twenty-five thousand dollars would be a small outlay for a comprehensive study in the field of secondary education, with a view to bringing about some order in this chaotic section of education. The National Education Association and numerous regional associations have passed resolutions that such a study be made.

The Bureau of Indian Affairs has asked the Bureau of Education to make a study of Indian schools and to suggest methods for their improvement. This study has been approved by the Secretary of the Interior, and a preliminary visit made to a number of Indian schools with a view to setting up this investigation. Using the report of the Institute for Government Research as a basis, a very valuable service can now be rendered through the Bureau of Education to the Indian schools.

The State superintendents of public instruction and commissioners of education have decided to hold a two-day conference in Washington in December with the Federal Commissioner of Education. One of the problems which they propose to discuss is the support and financing of schools. In view of the fact that the costs of public schools have more than doubled in the last few years, it seems that such a study would be highly serviceable to the cause of education; measures might be formulated in the interest of economy that would prove most efficacious. This whole field is relatively unexplored. Every conceivable form of taxation is used in the effort to support schools. No one has attempted to show the most satisfactory ways of raising funds for school purposes. A sound and economic program for expenditures is equally as important as a proper system of revenue. These and other studies ought to be made as quickly as funds are available.

(2) In my last report I set out in some detail the situation with reference to printing funds for the Bureau of Education. This remains the most acute need of the bureau. At present the bureau is not able to print all of the studies which are produced by the specialists. This is an unsound and uneconomic procedure. The Bureau of Education is essentially a bureau of research and information. If the channels for communication through printing are not kept open, its research function is enormously impaired in value. There is nothing that I could urge more emphatically than the necessity for adequate printing funds if the bureau is to enlarge its usefulness.

(3) The program of improving the Alaskan service is progressing. The Governor of Alaska during the summer made a tour of inspection in the Territory largely by airplane and reported most of our schools in much improved condition. The program of industrial training in Alaska is proving satisfactory, and an industrial school in southeastern Alaska, similar to the three which have been established in other parts

of the Territory should be erected as early as feasible. The matter of transferring the health work among the natives of Alaska from the Bureau of Education to the United States Public Health Service has been carefully investigated. The Public Health Service recommends that this work be continued in the Bureau of Education; it is of the opinion that the work now being done by the Bureau of Education is as satisfactory as could be expected with the limited funds available.

I am glad to report continued progress in the solution of the reindeer problem. Several relatively large boats, with considerable refrigeration, are now operating between Alaska and Seattle and larger quantities of reindeer meat are being brought down. A trial of reindeer meat was made in the United States Navy but unfortunately an attempt was made to substitute reindeer meat exclusively for beef. Under such circumstances it was hardly expected that reindeer meat would be preferred in all cases to the beef. Nevertheless, a very considerable proportion of the men expressed such a preference. If reindeer meat were placed on the rations as an alternative, I believe that a large amount of the surplus supply would be thus consumed in the Navy. We have now appointed a reindeer man who will have charge of the general administration of the whole reindeer industry in Alaska. Under him will be an organization of supervisors and natives trained for the work. Arrangements have been made whereby a number of natives will be sent each year to the college at Fairbanks where they can be given scientific training in the husbandry of reindeer. A reindeer experiment station is maintained at that point and this would seem to be an ideal way of translating the scientific information obtained into practice by the natives. A succession of trained natives going into the industry would rapidly improve the whole system of handling deer.

The great increase in the number of herds of reindeer in northern and western Alaska rendered it urgent that provision be made for the allotment of grazing lands. By the act of March 4, 1927, authority was granted for the establishment by the Secretary of the Interior of grazing districts in Alaska and for granting leases for definitely described areas. The provisions of this act are being carried into effect as rapidly as possible. This action will regulate the occupancy of grazing lands by the reindeer herds and prevent friction among the owners of reindeer in regions where the herds are numerous.

In extending the reindeer industry among the natives the reindeer were distributed among them through a system of apprenticeship which has resulted in a large number of individual owners. In 15 widely separated regions native owners have combined their herds and formed cooperative associations in order to safeguard their

interests. More efficient methods for the sale of meat and hides, economy in herding, and simplification in marking reindeer have resulted. Thus one mark for the entire association answers for the large number of marks of individual owners.

Let me say that I believe the Bureau of Education is on the eve of marked development and a larger service to education in the country. During the next few years its activities will become considerably more valuable and effective than they have been in the past.

May I take this opportunity to express my appreciation for the evident interest which you have displayed in the Bureau of Education during the short time in which I have had the honor to work with you. Your educational background and enthusiasm for the cause of education augur well for the educational outlook and particularly for the improvement of this bureau.

Respectfully submitted.

JNO. J. TIGERT, *Commissioner*.

THE SECRETARY OF THE INTERIOR.

GEOLOGICAL SURVEY¹

The Geological Survey meets a public need. Its maps and inventories of natural resources are in increasing demand, and the recognized value of these contributions to the progress of country-wide development leads most of the States to cooperate in the mapping and research program of this Federal service. This year such contributions coming from 38 States and Hawaii exceeded three-fourths of a million dollars.

The Geological Survey also acts as a consulting engineer to other Federal agencies having need of the services of its technical staff. The volume of work thus performed is measured by the funds transferred for services rendered, this item exceeding one-third of a million dollars in the fiscal year 1928.

With these additions to the amounts directly appropriated, the total funds available for the investigative and other work of the Geological Survey amounted to \$2,909,170.

Even the most distinctly Federal work of the Geological Survey must be regarded as in a sense cooperative with the States, since of the more than \$4,000,000 of revenue accruing in 1928 from the Federal mineral leases, all but 10 per cent goes directly to the States or to the reclamation fund for local expenditure. The Geological Survey's engineering supervision of the private operations under the mineral leasing laws and of leases on Indian lands costs between 2 and 3 per cent of the aggregate income and would have been even less this year except for the lower prices of the minerals and for the Department of the Interior's liberal encouragement of practical conservation measures by not enforcing drilling requirements in the development of oil leases and by permitting shut-in production to an extent not equaled by other landlords.

A less tangible measure of appreciation of the country's need of surveys and investigations of the type in which the Geological Survey is engaged is afforded by the general demand for an increase in such work. In recent months the chambers of commerce and mining and development associations in the West and the engineering societies of the whole country have called attention to the increasing need of Federal investigations in aid of mining and other development, characterizing the Geological Survey's half century of service in

¹ A more detailed report of the work of the Geological Survey is published in the annual report of the director.

aiding "in finding, developing, and conserving the natural resources of our country" as a fundamental and indispensable contribution to the mining industry.

The fact that too often escapes notice is that the present high-pressure industrial development throughout the country involves an ever greater demand for raw materials as well as for the basic engineering information required in the great constructive undertakings by private enterprise and by the Government itself.

It is difficult to appreciate the full scope of developmental activity that calls for the investigative work by the Government scientific bureaus. Where the topographic map once served a single purpose it is now utilized in a dozen ways; similarly, exact information regarding water resources, both surface and underground, is demanded by State and municipal officials and by the promoters of industrial and agricultural projects. The need of geologic investigation is possibly even greater, in view of the present magnitude of the output of the mines and oil wells of the country. In its growth in volume of output the mining industry stands by itself, but in the process of furnishing the needed raw materials to other industries in rapidly increasing quantities mines and wells become more rapidly exhausted, and new deposits must be found. Thus arises the demand for more and better geology, as voiced in the many expressions of public opinion from the mining centers of the country. The United States Geological Survey is being called to take the lead in an intensive study directed to the finding of ore, in order to forestall any serious decline in the needed supply of the metals and other essential minerals, with the consequent slowing down of all industry. The premise commonly mentioned in these requests for increased activity is the recognized pioneer work by the geologists and engineers in the earlier decades of developmental progress in the Western States.

The scope and extent of activities for the year may be summarized under the main types of work specifically recognized in the appropriations made by Congress.

GEOLOGIC WORK

Geologic work was done in 43 States, Alaska, and the District of Columbia, and in this work 16 of the States cooperated. The cooperative work consists mainly of the study of specific problems on a cost-sharing basis. Among the results of such work are contributions to geologic maps of Arkansas, Florida, Pennsylvania, Texas, and Virginia, a type of cooperative endeavor in which the help of the Federal geologists is fully appreciated by the State officials. Other geologic work was done in cooperation with other Government organizations and with nongovernmental scientific associations.

Cooperative investigations bearing on oil and gas resources were made in 1 State, on metalliferous deposits in 5 States, on potash in 2 States, on coal in 3 States, and on general geologic problems in 17 States. The investigations in search of potash, carried on in cooperation with the Bureau of Mines, centered largely in Texas, where 3 sites for core drilling were selected, and the drilling at 5 other sites was completed. The cores were studied and selected portions analyzed, and preliminary reports on the economic results were prepared. These results are decidedly promising.

Volcanologic studies were carried on in California, Alaska, and Hawaii. Numerous paleontologic determinations were made. Investigations of ore deposits, coal, oil shale, and other minerals and studies in glacial geology, stratigraphy, and structure were continued.

In the chemical laboratory the potash exploration was given first attention, 5,627 samples of potash salts being examined. In connection with other specific problems 71 specimens of rocks and minerals were subjected to special examinations and tests; 2,055 specimens were identified for private persons. Further work was done on problems connected with petroleum recovery.

EXPLORATIONS IN ALASKA

For more than 30 years the Geological Survey has supplied information regarding the mineral resources of Alaska. Hundreds of maps and reports have been published and distributed covering more than two-fifths of the Territory. But the project of making an inventory of Alaskan resources is one whose entire accomplishment is still far in the future, even though the purchase of Alaska was made 60 years ago.

As in other years, the effort this year has been to contribute directly to the development of the great northern Territory by surveying unmapped areas and making known the geographic and geologic facts essential to the utilization of latent resources. Nowhere is scientific pioneering more needed.

The principal explorations conducted by the Geological Survey in Alaska in the field season of 1927 were made in the Copper River region, the northeastern part of the Yukon Basin, and the Mount Spurr region of the Alaska Range. The work in the Yukon Basin resulted in 3,700 square miles of geologic mapping and 4,900 square miles of topographic mapping of previously unmapped country, also a geologic resurvey with greater precision of 300 square miles. The Mount Spurr expedition accomplished the topographic mapping of 2,265 square miles and the geologic mapping of 2,000 square miles of new country.

The compilation of the aerial photographs of southeastern Alaska taken by the Navy Department at the request of the Geological Survey was continued, and a drainage map of a tract of about 2,000 square miles in this region was completed. Six field projects were in progress at the end of the fiscal year 1928, including reconnaissance and detailed topographic mapping in southeastern Alaska, geologic reconnaissance in the Copper River, upper Tanana, and Yukon regions, and geologic and topographic reconnaissance in the Alaska Range. Some of the work in southeastern Alaska is being done for the Forest Service, which is bearing the cost.

A notable use of airplane transportation materially facilitated the work of one party. The services of a commercial airplane were employed in reaching a region in the Alaska Range too remote to be economically reached by other means in the short field season. By air the distance was covered in 1 hour and 20 minutes that took the pack train 3 weeks of hard travel to traverse. Air transport thus added three weeks to the working period of the geologist and engineer and also saved an extra trip by the pack train to take in necessary supplies.

The supervision of operations under leases issued by the Government for extracting coal and oil on public lands was continued during the year, a small staff being maintained at two local offices in Alaska for this purpose.

TOPOGRAPHIC MAPPING

The great project of covering the United States with adequate topographic maps proceeds but slowly, only one-half of 1 per cent of the total continental area, exclusive of Alaska, being added this year to the completed map. Yet the total area mapped in this single year—17,721 square miles—exceeds the area of several European countries, being approximately that of either Albania or Denmark.

As in other years, the topographic work was done in cooperation with 26 States, and the area mapped amounted to 17,721 square miles in 34 States, the District of Columbia, and Hawaii. Of this total 13,777 square miles represents new surveys, 2,407 square miles resurveys, and 1,537 square miles revisions. The total area mapped to June 30, 1928, is 1,314,316 square miles. Nine States and the District of Columbia are now entirely mapped, and the percentages in the other States range from 8 to 88.4. Of the total continental United States exclusive of Alaska, 43.2 per cent has been mapped.

River surveys amounting to 14 linear miles and 101 square miles were also made. In connection with the topographic work 6,272 miles of spirit levels and 4,046 miles of transit traverse were run and 157 triangulation stations were occupied.

Cooperation was continued with the Air Corps, United States Army, whereby aerial photographs were furnished for use in topographic mapping. A shaded relief and highway map of New Hampshire and a contour map of Virginia were compiled in cooperation with the respective States.

The total funds available for topographic work by the Geological Survey included the \$510,200 of the Federal appropriation and approximately \$395,000 contributed by the States, so that with the funds transferred from other Federal funds for services rendered the total was over \$932,000.

INVESTIGATIONS OF WATER RESOURCES

The larger demand for reliable information concerning the water resources and the increasing appreciation of the advantages, in both economy and efficiency, of joint investigation materially increased the cooperation between the State and Federal Governments. This resulted in an increase of nearly 20 per cent in expenditures for these investigations under the Geological Survey.

The amount expended by State, county, and municipal agencies for such work during the year, and disbursed in part directly and in part through the Geological Survey, was \$338,819. This sum covered work in 31 States and Hawaii and, with funds furnished by permittees and licensees of the Federal Power Commission and transferred from other Federal agencies, amounted to \$459,000, or more than three times the Geological Survey's own appropriation of \$147,000.

The study of surface waters, which consists primarily of the measurement of the flow of streams, was carried on in 42 States and Hawaii, in which at the end of the year 1,830 gauging stations were being maintained. The work on ground-water resources has been planned to meet the more and more exacting public demand for precise information with increasing need for the water. Investigations relating to ground water and reservoir sites were made in 15 States. Research into the principles of hydrology has been continued in order to provide a more secure basis for ground-water investigations, especially in the Western States. A hydrologic laboratory and three experiment stations have been maintained, 30 automatic water-stage recorders have been installed over observation wells, and thousands of measurements of water levels in wells have been made. Cooperation was continued with well drillers' associations with a view to developing higher standards and better results in water-well drilling. The work on quality of water involved the laboratory examination of 801 samples.

The investigations of power resources included the preparation of monthly and annual reports on the production of electricity by both

water and steam power and on the consumption of fuel by public-utility power plants. A report on the developed and potential water power of the United States was published.

WORK IN CLASSIFYING AND LEASING PUBLIC LAND

The work of the conservation branch of the Geological Survey is increasing. The official requests received this year show an increase over 1927 of 63 per cent in inquiries involving the mineral character of public lands, 44 per cent in inquiries as to water-power or water-storage value, and 12 per cent in inquiries involving the agricultural utility. Meeting this demand for special consideration has involved a sacrifice of the broader investigations necessary for the acquirement of basic information concerning the value and proper disposition of the remaining public lands.

Likewise the supervisory work in protection of the public interest in the mineral deposits being developed under lease has continued its steady growth. There has been an increase of 10 per cent in the number of leases under supervision, and the recent discovery of two new oil fields on public lands demonstrates that no decrease in supervisory activity can be expected. A decrease in the number of outstanding prospecting permits expresses activity by the Geological Survey and the General Land Office in canceling permits for failure of the permittees to begin operations.

The work of classifying public and Indian lands with respect to mineral content and of supervising mineral operations on such lands was carried on in 21 States and Alaska. The number of cases involving land classification acted on during the year was 19,956, and the results accomplished include net decreases of 720 acres in the area of outstanding coal withdrawals, of 3,960 acres in outstanding petroleum withdrawals, and of 13,276 acres in outstanding phosphate reserves. At the end of the year the total area classified as mineral in character amounted to 36,488,995 acres in 14 States and Alaska and the outstanding mineral withdrawals to 44,951,277 acres in 14 States. Definition of the "known geologic structure" of producing oil and gas fields was continued, and at the end of the year the net area so defined was 517,745 acres in seven States.

Investigations to obtain information for classifying public land with respect to its value for the development of water power were made in four States. There was a net increase of 143,754 acres in the area included in power reserves, making a total of 6,233,762 acres in 20 States and Alaska, on which about 15,000,000 continuous horsepower can be developed. The net increase in enlarged-homestead designations was 476,900 acres, making a total outstanding of 325,159,793 acres in 14 States, and the net increase in stock-raising home-

stead designations was 1,023,934 acres, making a total outstanding of 119,124,604 acres in 18 States. There was a net increase of 37,814 acres in public-water reserves, and the total outstanding is now 403,391 acres in 12 States.

The supervisory work on public lands subject to the mineral leasing laws was increased between 10 and 12 per cent by the receipt of 85 leases, 4,588 permits, and 8 licenses, covering 7,910,582.60 acres. The production of petroleum on such lands during the year was 23,370,549.38 barrels, on which the oil, gas, and gasoline royalty value was \$3,735,451.41. The production of coal on such lands was 3,000,248.38 tons, of phosphate rock 23,459.95 tons, and of sodium 16,127.99 tons, on which the royalty rentals and bonuses amounted to \$387,307.10.

Supervision over oil and gas operations on naval petroleum reserves was continued, and the petroleum produced amounted to 9,839,859.19 barrels, on which the oil, gas, and gasoline royalty value was \$2,232,375.39. Inspectional, regulatory, and advisory service was rendered in connection with the leasing of mineral deposits on Indian lands in eight States, with a royalty value of over \$7,000,000, nearly all in Oklahoma.

PUBLICATIONS

The making of a topographic survey or a river measurement or a geologic examination of a mining district is only part of the task entrusted to the Geological Survey. Completion of such public work requires the publication of the results as a topographic map, water-supply paper, or geologic report and its wide distribution among those who may put the information therein contained to practical use.

The demand for the results of the Geological Survey's surveys and investigations may be measured by the distribution of its publications, which this year passed the million mark—copies of reports and maps distributed on request.

Another index of increasing demand is afforded by the number of visitors to the principal local offices of the Geological Survey in the West. These offices, at Denver, Salt Lake City, San Francisco, and Los Angeles, make a special effort to answer all inquiries for geologic and engineering information, whether included in published reports or not, and this year they served 8,464 callers, an increase of nearly 10 per cent over the preceding year. General correspondence between the public and the Washington office increased 5 per cent, as did also the distribution of publications on specific request. As in other recent years the number of both books and maps distributed has exceeded the number printed in the same period, proving that there is no accumulation of dead stock on the shelves. Especially notable was the increase of nearly 15 per cent in the sales of maps.

In the distribution of its publications the Geological Survey is a going concern.

The publications of the year consisted of 53 books and pamphlets of the regular series (including 5 reprints), 150 new or revised maps, 165 reprinted maps, and numerous circulars, lists of publications, etc. The total number of pages in the new book publications was 5,639. In addition to the publications in the regular series 94 brief reports were issued in mimeographed form as memoranda for the press. The manuscript edited and prepared for printing amounted to 23,193 pages; 2,686 galley proofs and 11,260 page proofs were read and corrected. Indexes were prepared for 24 publications, covering 5,670 pages. The drawings prepared for publications numbered 2,605, and the proofs of illustrations examined 1,423. Maps for 2 folios were wholly or partly prepared for engraving, and maps and illustrations for 47 other reports were edited. The new topographic maps edited and transmitted for engraving numbered 86, and 706 other maps were edited. Map proofs numbering 755 were read. Of new and reprinted maps and folios 748,860 copies were printed. The publications distributed numbered 1,006,888, of which 5,111 folios and 699,365 maps were sold for \$48,762.35.

THE BUREAU OF RECLAMATION

The irrigable area in 1927 of the projects built by the Government was 1,956,910 acres, an increase of 112,360 over that of 1926.

The area irrigated was 1,378,990 acres, a decrease of 32,030 acres.

The area cropped was 1,431,560 acres, an increase of 102,750 acres.

The gross value of crops grown on these projects in 1927 was \$72,047,200, an increase of \$11,677,580 compared with 1926.

The area to which water was supplied under Warren Act or other water service contracts in 1927 was 1,482,950 acres, an increase over the previous year of 153,930 acres.

Of this area 1,148,115 acres were irrigated in 1927, an increase over the previous year of 50,925 acres.

The cropped area was 1,072,486 acres, an increase of 122,896 acres.

The gross value of crops grown on this land was \$61,160,010, an increase of \$11,409,970 over that of the previous year.

The total value of crops grown in 1927 on irrigated land furnished with water from the works of the Bureau of Reclamation was \$133,207,210, an increase of \$23,087,550 compared with 1926.

The income to the Bureau of Reclamation during the fiscal year was \$9,303,330.25, or \$377,388.84 less than the previous year.

The operation expense for the year was \$1,762,952.67, a decrease compared with the previous year of \$52,414.88.

The payments received from water users for operation and maintenance were \$1,843,384.86, or \$214,299.40 greater than in the previous year.

Excess of operation and maintenance receipts over expense for the period amounted to \$80,432.19, compared with a deficit of \$186,382.09 for the previous year.

The amount appropriated for construction was \$9,869,000, compared with \$4,443,000 the previous year, both figures exclusive of reappropriations.

The amount expended on construction was \$6,966,449.25, compared with \$5,189,025.93 the previous year.

The construction payments by water users were \$3,455,764.69, an increase of \$784,221.79 compared with the previous year.

The total payments from water users in the fiscal year 1928 amounted to \$5,299,149.55 compared with \$4,260,221.35 in 1927, an increase of \$1,038,928.20.

PROJECT REPAYMENTS

Settlers did better on repayment of the charges against their lands during the fiscal year than ever before, paying into the Treasury on this account \$5,299,149.55, compared with \$4,260,221.35 the previous year. Thus the payments for the fiscal year ending June 30, 1928, exceeded those of 1927 by \$1,038,928.20, or nearly 25 per cent.

This marked increase in repayments is attributable to two main causes. The first is the fact that money is available for repayments because of the general prosperity of the project water users. The second is the fact that there has been a general readjustment of the financial relations between the Government and the water users, and that the new bases of payment are such as to make satisfactory returns possible.

Twenty-four of the projects are now on an operating basis. The financial status of these is such that 22 projects are now making regular repayments to the Government of the money advanced to them. The other two projects will reach a repayment basis in the next two or three years under the terms of their contracts.

CONSTRUCTION AND OPERATION RECORD FOR 1927

Guernsey Dam on the North Platte project, Nebraska-Wyoming, was completed early in the fiscal year. Work was begun on Stony Gorge Dam, Orland project, California, and at the end of the fiscal year the dam was more than 90 per cent completed. The Gibson Dam on the Sun River project, Montana, was about 50 per cent completed at the end of the year, and preliminary work was under way on the construction of Echo Dam, Salt Lake Basin project, Utah. Work continued on canal construction for the Kittitas division of the Yakima project, Washington, and a contract was awarded for the construction of Easton diversion dam.

A contract was awarded and preliminary work begun on the construction of the Owyhee Dam, on the Owyhee project, Oregon-Idaho. This dam when completed will be the highest dam in the world, 43 feet higher than the 362-foot Schraeh Dam in Switzerland. Preliminary work was also begun on the construction of the Harper diversion dam, earthwork, tunnels, and structures on the Vale project, Oregon.

The following table gives data concerning the dams under construction during the fiscal year:

DAMS UNDER CONSTRUCTION BY THE BUREAU OF RECLAMATION

Cost includes dam, spillway, outlet works, and bridges on dams, but does not include auxiliary features such as right of way, roads, and clearing reservoir site

Project	Name	State	Type	Maximum height	Crest length	Volume	Estimated cost
				<i>Feet</i>	<i>Feet</i>	<i>Cubic yards</i>	
Orland-----	Stony Gorge	California---	Hollow reinforced concrete.	142½	868	43, 135	\$1, 069, 310
Owyhee-----	Owyhee-----	Oregon-----	Concrete arch-gravity--	405	835	525, 000	15, 378, 125
Salt Lake Basin	Echo-----	Utah-----	Earth fill.	130	1, 900	1, 461, 000	1, 645, 500
Sun River-----	Gibson-----	Montana-----	Concrete arch.	205	882	160, 000	2, 627, 600
Vale-----	Harper-----	Oregon-----	Concrete gravity with earth and rock fill embankment.	30	700	1, 570	70, 000
						8, 000	
Yakima-----	Easton-----	Washington--	Concrete gravity-----	65	248	5, 500	200, 000

¹ Exclusive of cost of constructing railroad.

Sixteen thousand four hundred and twelve miles of canals, waste-water ditches, and open and closed drains were operated, of which 50 miles were constructed during the year.

Eight hundred and seventy canal structures were built, bringing the total to the end of the year to 146,154.

During the year the bureau constructed 158 bridges, 596 culverts, 8 tunnels with a total length of 8,911 feet, 143 flumes, and 153 miles of transmission line; and laid 171,510 linear feet of concrete, metal, tile, and wood pipe. The excavation of earth, indurated material, and rock during the year amounted to 10,399,874 cubic yards, bringing the total to 266,826,132 cubic yards.

CONTRACTS

One index of the bureau's activities during the year is the number of contracts entered into and the different subjects involved, which are summarized in the following table:

Nature of contracts	Number of contracts	Amount involved
1. Cooperative investigations-----	5	\$58, 600. 00
2. Supplies-----	656	295, 061. 89
3. Material-----	396	1, 920, 489. 00
4. Equipment-----	138	179, 818. 85
5. Miscellaneous service-----	106	60, 642. 59
6. Construction work-----	65	9, 523, 630. 16
7. Land purchases, including improvements-----	91	185, 455. 10
8. Land sales, including improvements-----	29	45, 943. 08
9. Leases to the United States-----	20	13, 204. 08
10. Leases from the United States-----	246	156, 553. 14
11. Compromise of damage-----	14	2, 697. 06
12. Rental of Government equipment-----	27	5, 181. 84
13. Rental of water-----	419	32, 482. 77
14. Sale of surplus electrical energy-----	50	654, 507. 37
15. Sale of water rights to towns-----	2	400, 216. 00
16. Sale of water rights under the Warren Act-----	29	2, 858. 40
17. Sale of water rights within projects-----	55	65, 059. 05
18. Adjustment and relief-----	3	5, 613, 750. 36
19. Transfer of project operation-----	4	33, 089. 76
20. Miscellaneous-----	75	47, 000. 77
	2, 430	¹ 19, 296, 281. 27

Estimated in part.

INVESTIGATIONS OF OPPORTUNITIES FOR PLANNED GROUP SETTLEMENT IN THE SOUTH

Investigations of opportunities for planned group settlement in the Southern States were continued under an appropriation of \$15,000 carried in the act of January 12, 1927. Economic data were obtained for each of the tracts designated for study in the States of North and South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee, and agricultural and financial programs were prepared for a number of these tracts.

Study of the tracts in North Carolina and Florida indicated that other tracts might be found in these States whose soil and topographic conditions would render them more suited to the proposed development. The governors of these States were accordingly requested at the close of the fiscal year to designate additional tracts for study.

In December, 1927, a southern reclamation conference was held in the Interior Department auditorium. The representatives of seven Southern States, together with delegates from other parts of the country, all interested in the promotion of better rural conditions and a more advanced type of agriculture in the South, met with officials of the department and the Bureau of Reclamation to consider the results of the investigations and to make plans for the future. The conference stressed the point that the proposed work does not contemplate the bringing into production of large areas of agricultural land, but of making contented, prosperous, organized rural communities. The policy of southern reclamation was indorsed and a recommendation was adopted that Congress be requested to authorize the work and appropriate funds to put it into effect in the Southern States, the money to be expended under the direction of the Bureau of Reclamation.

As a result of the conference, bills were introduced in the Senate by Senator McKellar of Tennessee, and in the House by Representative Crisp of Georgia, authorizing the creation of organized rural communities to demonstrate methods of reclamation and the benefits of planned rural development; and authorizing an appropriation of \$10,000,000 to carry on the work in the States of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. The Senate bill was referred to the Director of the Budget who stated that the proposed legislation would be in conflict with the financial program of the President. However, the House bill was favorably reported to the House from the Committee on Irrigation and Reclamation, but was not reached for consideration prior to adjournment. In view of the report from the Bureau of the Budget the investigations of the Bureau

of Reclamation were temporarily discontinued. The act of March 7, 1928, appropriated \$15,000 for continuing the work of investigation, and plans were being made at the close of the fiscal year to proceed with the work, with especial attention to North Carolina and Florida.

ECONOMIC AND ENGINEERING OPERATIONS

SALT RIVER PROJECT, ARIZONA

Economic.—Of the 7,500 irrigated farms on the Salt River project, 6,450 were operated by owners and 1,050 by tenants. All land is privately owned, and the project is fast being recognized as a land of suburban homes. The elaborate system of paved roads, the warm winters, numerous recreational and resort features, and the availability of electricity on every farm under the program just financed, are factors which are bringing increasing numbers of well-to-do home seekers to the valley.

Agricultural conditions are favored by the 12 months' growing season, making two crops possible on the same land. The three major crops from an acreage standpoint are alfalfa, cotton, and grain. Gross receipts from all crops last year were \$21,200,000. In addition, livestock was valued at \$5,435,000.

Engineering.—The last big construction unit, Horse Mesa Dam, was completed in August, 1927. A fourth big dam on Salt River at Stewart Mountain, 10 miles below Mormon Flat Dam will soon be started under a \$5,100,000 bond issue sold by the Salt River Valley Water Users' Association on May 28, 1928. This bond issue also provides for the construction of power lines to serve every farm on the project. The gross income from the sale of power during the fiscal year was \$2,157,940.91.

Drainage is accomplished almost entirely by pumping. Some 15.85 miles of open and 5.3 miles of closed drains had been constructed prior to 1922, but are now effective merely to carry off pumped or other water discharged into them, since the ground water level has been lowered below the bottoms of the drains. In 1918 a third of the 240,000 acres of project land were threatened with water-logging and had a water table within 10 feet or less of the surface. The water table is now everywhere below the point where it is injurious and not over 3,000 acres have water within 10 feet of the surface. One hundred and sixty pumps are operated on the project, and the maximum capacity is approximately 800 second-feet. Most of the water is used for the irrigation of project land or of land in outside districts.

YUMA PROJECT, ARIZONA-CALIFORNIA

Economic.—Farming practice on the Yuma project would be improved if there were less tenant cultivators. Thirty-nine per cent of the farms were cultivated by tenants in 1927. This is less than

the previous year owing to better prospects for higher cotton prices, the acreage of which increased about 30 per cent above that of 1926. Cantaloupe and lettuce acreage decreased.

Two new cotton gins were constructed and plans were being made to construct a new cold storage plant and warehouse in the near future. Considerable activity was manifested in the construction of residential buildings, and contracts had been let for enlarging the facilities of the Union High School at Yuma. Bonds were voted for the erection of a junior high school at Somerton, in the valley division. A 7-room addition was made to the city grammar schools. Two packing houses were in operation most of the season shipping lettuce, cantaloupes, peas, and tomatoes.

It is anticipated that with a good yield of cotton and a good price the economic condition of the settlers will show improvement.

Delinquency in the payment of water-right charges has been reduced to 5.36 per cent compared with 7.52 per cent last year.

Yuma-Mesa.—One hundred and twenty-one acres were planted to citrus trees this year on land under public notice and 20 acres additional under water-rental contracts. This makes the cultivated area under public notice 1,017 acres and 62 acres under water-rental contracts, a total of 1,079 acres to which water is being delivered on the Mesa division. Greater activity is anticipated for the coming year.

Engineering.—The Siphon Drop power plant built to provide cheaper water for Yuma Mesa is accomplishing its purpose. It has lowered the cost of pumping 35 per cent. The power plant's output for the year was slightly over 6,000,000 kilowatt hours. Extension of drainage works in the Valley division was carried on throughout the year. Further extension of drainage is required and more drainage will be needed in the Bard division. Work in the latter division will be done as supplemental construction.

ORLAND PROJECT, CALIFORNIA

Economic.—Water users on the Orland project had a successful year. Prices for most farm products were good and the water supply was sufficient. Farms under operation numbered 698, of which 171 were farmed by tenants, a large number of whom are resident project land owners. The population on the irrigated farms was 1,841, a gain of 122 over the previous year. Satisfactory increases are apparent in the crop yield and in the irrigated and cropped acreages as well as in values of stock and farming equipment and in land investment. Bank deposits were larger than for any year in the project's history.

Sixty-four farms comprising nearly 1,800 acres were placed under option to the United States for advertisement and sale to qualified land buyers at prices determined by independent appraisal and on

terms involving 6 per cent amortized 20-year repayments. An edition of an illustrated booklet, describing the project in general and the farms under option, was published by the bureau and given wide distribution largely through advertising financed by local interests, as a result of which over 500 inquiries were received as well as about 20 applications. Most of the applications were approved by the examining board. Only two of those qualified, however, acquired project land. The attention focused on the project through the distribution of the booklets and the advertising is considered well worth the expenditures incurred.

The Orange Growers' Association and the Almond Growers' Exchange experienced a profitable year. Dairying continued to be a staple industry and prices for butterfat yielded profitable returns. Project dairy herds afforded a ready market for most of the alfalfa produced, less than 100 tons of hay being shipped from Orland during the year.

Reclamation charges outstanding at the close of the fiscal year were slightly less than 6 per cent of the accruals for the four years in which delinquencies exist.

Federal farm loans placed on project lands amounted to \$700,500 at the end of the calendar year 1927.

Engineering.—Construction at Stony Gorge Dam was actively under way throughout the year. The contractor completed excavation, placed 40,000 cubic yards of concrete in the structure, and installed considerable operating machinery. In the reservoir basin, 4 miles of new county road were constructed to replace public roads which will be submerged. At the close of the fiscal year, the Stony Gorge supplemental construction as a whole was 90 per cent completed; and it will be finished during the early part of the fiscal year 1929. Some concrete lining was placed on the distribution system where heavy maintenance work was involved.

GRAND VALLEY PROJECT, COLORADO

Economic.—The public notice of October 12, 1927, terms of which were modified by the repayment contract signed by the Water Users' Association on January 4, 1928, has had a beneficial effect on the morale of the project. The association, realizing the necessity of enforcing assessments against idle lands, has undertaken foreclosure suits which in a relatively short time will give this organization control of considerable areas at prices which will be attractive to colonists. This action is reflected in the efforts of resident owners to increase their cropped area to carry the current charges, and it also prevents increase in land values. Several sales under contract have been made and more are in prospect.

Crops have been generally good, except for early potatoes, which failed for the second year due to attacks by insects or a disease not yet successfully controlled. Beans gave excellent returns and the acreage in this crop was materially increased in 1928. A liberal sugar-beet contract by the Holly Sugar Co. resulted in a marked increase in this crop for 1928. Alfalfa continues to embrace the largest acreage and was fairly profitable in 1927.

On June 30, 1928, nearly all of the estimated cost of operation and maintenance, \$48,000, had been advanced by the water users. The initial installment of the construction charge had also been paid.

The project needs from 75 to 100 good farmers on the Gravity division and nearly as many on Orchard Mesa. Progress is being made in organizing a settlement campaign for both divisions.

UNCOMPAHGRE PROJECT, COLORADO

Economic.—Of the 1,768 irrigated farms on the project during the season of 1927, 850 were cultivated by owners and 918 by tenants. The increase in tenancy is due to a number of reasons, including investment in project lands by persons who still retain other previous occupations, acquisition of land by mortgage holders, such as banks, loan agencies, etc., and the belief by many owners that it is more profitable to rent their farms than to attempt their cultivation themselves, especially since the influx of cheap labor, the result of beet growing in the valley.

A few good farms are unoccupied and most of them have the usual farm improvements. Three farm units were filed upon during the year and a number of outside purchasers and new tenants were added to the project population.

The beet-sugar factory at Delta, Colo., handles the project beets and also refines the sirup from the Grand Junction factory. The creameries are doing well, and the flour mills are in a flourishing condition. A cheese factory, started in Montrose during the year by the Kraft Cheese Co., has been prospering and increasing its output.

The principal marketing association is the Colorado Potato Growers' Association, and a majority of the growers are now members. In addition a poultry marketing association is making considerable progress.

Engineering.—A considerable area of the project is seeped and the productivity of other lands impaired. The extent of the seeped areas and the estimated cost of drainage have not been determined because individuals have elected to carry out their own drainage work, and until recently the water users have taken little interest in a comprehensive drainage plan.

The adjustment contract of April 8, 1927, makes provision for the expenditure of \$400,000 at some future time, in order to complete

the concrete lining of the Gunnison Tunnel, provided such work is deemed advisable and in case it is requested by the stockholders of the Uncompahgre Valley Water Users' Association.

BOISE PROJECT, IDAHO

Economic.—Tenancy on the project has decreased in the past year from 46 per cent to 40 per cent. More excess water was used in 1927 by tenants than by owners, indicating better preparation by the latter.

Hay promises to be more profitable this year, and bluegrass pasture is paying well through dairy products.

There is little change in the uncultivated area since last year, about 40 tracts comprising 1,200 acres being unoccupied. At least 100 new settlers located on the project since September, 1927. Some good farms can still be purchased for \$125 an acre, subject to water charges. Terms are usually 40 to 50 per cent cash with $6\frac{1}{2}$ to 7 per cent interest on the balance.

Industries handling dairy and poultry products, vegetables, and fruit are multiplying and prospering. Canning and pickle factories are contracting acreage much more easily than last year.

In the Arrowrock division lands placed in class 5 in 1924 will be reviewed in July, 1928, and a final classification recommended. This class includes 6,400 acres or 4 per cent of the area of the division. There is no class 6 land in the Arrowrock division.

Engineering.—In the Arrowrock division, storage and diversion works and power and pumping plants were operated and maintained by reclamation forces, and the canal system has been taken over by the water users. Main canal improvement and the construction of additional drains provided for in contracts with the irrigation districts were continued. Reconstruction work on the Riverside Canal, under contract with that district, was ended in February.

KING HILL PROJECT, IDAHO

Economic.—Of the 182 irrigated farms on the project, 121 were operated by owners and 61 by tenants. Some small tracts were abandoned and some additional lands put under cultivation by the residents. No property was foreclosed to satisfy mortgage liens.

The tendency toward discouragement is a little more marked than last year because of the low prices of early potatoes. Some potatoes were dug and loaded on the cars at 45 cents per hundred which brought little more than the cost of digging and delivering. The farmers went into early potatoes quite extensively, having purchased about six carloads of seed. The crops most successfully raised on the project are potatoes, alfalfa, corn, and small grains.

The yield of alfalfa was not quite so heavy as in the past as the old seeding has become infested with a disease which is gradually killing it. However, on the whole, the alfalfa crop was not so bad and the price bids fair to be good in localities where winter feeding conditions are good as to water, location, etc.

As in the past the settlers are complaining about the quantity of water delivered. Some extremely sandy lands which require a great deal of water do not receive as much as the owners think they should have in the peak of the season.

It is difficult, if not impossible, for the farmers to borrow any money on their real estate. However, more or less money is borrowed for living expenses and harvesting, giving as security personal property and growing crops.

MINIDOKA PROJECT, IDAHO

Economics.—There was a decrease from 2,520 to 2,390 in the number of farm units on the project during the year, owing to consolidation of farms into larger tracts. Tenancy increased from about 41 per cent to 44 per cent, owing partly to this change and partly to an increased demand to rent land. Improvement in crop conditions and general farm appearance is noted where relief has been afforded by drainage of wet lands or suspension of charges on unproductive land. About 30 farms were sold during the year at prices ranging from \$80 to \$190 per acre with the majority priced between \$125 and \$150 per acre.

Livestock market conditions were good and the local market for hay was better than for some years. The sugar factory at Burley produced 125,000 sacks of sugar. The project furnished 46,567 tons of beets at a base price of \$7.50 per ton. The market for other agricultural products was fair except for potatoes. The water supply for 1928 was abundant with all reservoirs filled and a large surplus run-off in Snake River.

A new highway bridge across Snake River near Heyburn was built by the State and highway district. This links the two divisions of the project near the center and is an outlet to farms along the north side of the river.

Engineering.—Recommendations of a board of engineers, covering protective work at Jackson Lake Dam, were being carried out at the end of the fiscal year.

An auxiliary transmission line 11 miles long was constructed connecting the second lift pumping station with the Minidoka Dam. New bays were added to the outdoor substation and switch yard at the Minidoka power plant, and a program of replacement of the old air-blast transformers by larger capacity oil-cooled equipment was inaugurated. Contract was let for the construction of 6 miles of

drainage canals on the south side division. This work was in progress at the end of the year. Three small pumping stations were constructed to utilize ground water and waste water by pumping into the lift canals.

Investigations looking to an increase in canal and pumping capacity of the south side system were under way. Plans were being considered for further increasing the power supply.

Canal location was continued on the Minidoka gravity extension division and on June 12 bids were received for the construction of 180 stations of main canal heading at Milner Dam.

HUNTLEY PROJECT, MONTANA

Economic.—Of the 584 cultivated farms 309 are cultivated by owners and 275 by tenants. Most of the leased land is in the possession of nonresident owners. Tenancy has been reduced considerably during 1927.

All good farms are occupied. Farms in classes 1 to 4 can be bought for \$75 to \$250 per acre, and farms in class 5 for \$10 to \$50 per acre. The usual terms of purchase are part cash consideration and the balance secured by mortgage. The interest rate on short-time loans is from 8 to 10 per cent and on long-time loans from 6 to 7 per cent.

The best money crops are sugar beets, beans, and wheat. The acreage in beets is decreasing and that in beans is increasing. A large number of the farmers are members of the Inter-Mountain Beet Growers' Association. The Huntley Project Development Association is growing in membership.

MILK RIVER PROJECT, MONTANA

Economic.—Owing to an exceptionally wet season there was little demand for irrigation water during 1927. Of 500 project farms cultivated during the year, 285 were irrigated and the balance dry farmed; 262 of these farms were operated by owners or managers and 238 by tenants. Many tenants have taken over tracts with options to buy if conditions are found satisfactory. Some of these tenants, especially upon the Chinook division, expect to go into the extensive production of sugar beets. The effect of tax levy for operation and maintenance purposes is being felt by the large land-owners, and many who in the past have not been particularly anxious to dispose of their holdings are now willing to subdivide and sell at reasonable prices.

About 250 additional farms, each containing a sufficient amount of productive land for the support of a family, can be supplied with water from constructed works. The Great Northern Railway con-

tinues active in its efforts to colonize the project, but aside from the beet-growing tenants has as yet secured no new settlers. Several options were obtained by local organizations at reasonable prices and terms from landowners who desire to dispose of all or a part of their holdings. Plans were being made to publish a booklet advertising the project early in the fiscal year 1929.

The Utah-Idaho Sugar Co. factory at Chinook continued operation at partial capacity. Although the acreage of beets harvested from project lands during 1927 was less than that of the previous year, practically the same amount of sugar was manufactured, owing to the exceptional quality of the beets. An intensive campaign for the enlargement of the beet acreage was carried on during the fall and winter of 1927, and as a result approximately 5,000 acres were planted during the past spring. A cooperative elevator located at Malta returned to the members of the association a profit of \$90,000 during the past year, or an increase of 15 cents per bushel for all grain marketed. The potato growers' association functioned satisfactorily during the year and was very active in obtaining a good market for the certified seed production.

Many farms are too large to be cultivated intensively under irrigation. These farms require subdivision and settlement. Before full irrigation charges are assessed a more intensive and profitable agriculture must be established. Blue-joint meadows producing an average of one-half ton an acre worth \$5 must be replaced with higher priced crops like alfalfa or sugar beets.

Efforts to secure settlers for unimproved land have failed. As a basis for settlement work farms should be partially improved. Conferences with those interested have been unsuccessful in promoting an organization to finance or do this necessary work. The urgent need of this project is to secure more good farmers and place them on partially improved farms under conditions where they will succeed.

Engineering.—Bank strengthening and removal of slides from the St. Mary Canal was continued, in order to utilize the full capacity of the canal. A small amount of additional work was done in the extension of laterals and the construction of minor structures to deliver water to lands recently included within irrigation districts, but not previously under constructed works.

SUN RIVER PROJECT, MONTANA

Economic.—The precipitation in 1927 was the greatest in the 39 years that records have been kept on the project. Seven inches of rain fell in May. As a result of these unusual conditions there was little demand for water until well along in July. Crops were better than usual, but a falling off in prices, particularly wheat, caused a reduction in average crop value.

The canal system on the Fort Shaw division has been successfully operated by the irrigation district beginning with January 1, 1927. All sums due the United States have been paid on the due date and the amount of delinquent payments due the district from individual water users is very small. The manner in which business affairs of the district have thus far been conducted has brought about a feeling of confidence in successfully operating the system in the future.

Fifteen new farmers, principally from southern Idaho, arrived on this division in the spring of 1928, some as renters and some as purchasers of farms that had heretofore been entered. The Cascade County Cow Testing Association, under the supervision of the county agent, has continued to work with the farmers and has done excellent work in improving the quality of dairy cows. Efforts are now being made to form a cooperative poultry association.

On the Greenfields division the general trend has been upward and most of the water users have improved their financial condition. Six new settlers came on the project in the spring of 1928. They have started in as renters and eventually may purchase farms. The Teton County Cooperative Association has assisted the farmers in selling livestock, principally poultry. A cow testing association has been formed and is doing good work in weeding out the poor cows, and the water users are taking a great deal of interest in programs of diversified farming.

The area sown to alfalfa and sweet clover should be increased with a corresponding decrease in the area planted to wheat. With the completion of Gibson Dam a large area will require settlement. This is unimproved land. Unless means can be found for partially improving farms and assisting new settlers in completing the development and equipment of farms, settlement progress will be slow. Without successful and rapid settlement, the payments on construction to the Government will be small.

Engineering.—The canal and lateral systems for lands in the Fort Shaw division have been completed, but drainage on a portion of the division is urgently needed.

Irrigation works and partial drainage works have been provided for approximately 42,000 of the 93,000 acres in the Greenfields irrigation district which comprises all of the irrigable land on the north side of the river. Storage for this area is required to supplement the normal low-water flow of Sun River, which is taken by prior private appropriators, so that there is no natural flow available for the project lands after the middle of July. Contract for the construction of Gibson Dam was awarded to the Utah Construction Co. September 13, 1926. Good progress is being made and the work was about 50 per cent completed on June 30, 1928. An appropriation of \$1,130,000 is provided for continuing work during the fiscal year 1929.

On May 8, 1928, a contract was awarded to the W. H. Puckett Co., of Boise, Idaho, for the construction of 6 miles of open drain for the relief and protection of about 4,000 acres of seeped and threatened areas on part 2 of the Greenfields division. An appropriation of \$25,000 was made to cover the cost of this work. The contractor has just started work at the end of the fiscal year.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

Economic.—There were 602 cultivated farms, irrigated and dry-farmed, on the project. Of these 392 were irrigated. In addition to these, 134 farms were not cultivated at all, owing largely to the fact that they did not have any buildings to house the farm workers. Farm owners cultivated 270 farms and tenants 332. During the current year 45 per cent of the farms were cultivated by owners compared with 41 per cent the previous year.

Settlement work was continued with the cooperation of the Northern Pacific and Great Northern Railroads. Twelve of the farms on which the bureau had taken options were sold and about the same number of nonlisted farms. Many of the sales were made to farmers who had previously been renters. It was found almost impossible to dispose of any unimproved farms without buildings. Efforts to have the owners and local business people organize a corporation to finance the improvement of farms have been unsuccessful. Local capital is not available for this purpose. The urgent need is the creation of an agency which will make and finance these needed improvements on long terms and at a low rate of interest.

A modern creamery specializing in the manufacture of butter and ice cream was built by the Armour Co. at Sidney, and the Holly Sugar Corporation continued the operation of its factory there. Flour mills were in operation at Sidney and Fairview, and a seed warehouse with facilities for sorting and grading various seeds, beans, peas, etc., was completed at Fairview.

The dairyman's association continued in operation with considerable benefit to its members. The Farmers Union has been extended to include the project and surrounding territory. This will apply more particularly to the marketing of grain. It is reported that a large number of farmers have joined.

The financial record of the irrigation districts has been very gratifying. The Montana district, which comprises about two-thirds of the project area, has paid every cent due, both for construction and operation and maintenance. The North Dakota district has paid its construction installments in full, but lacks about \$8,000 of having paid its estimated operation and maintenance charges. Sufficient money has been advanced, however, to meet all expenditures required

for operation and maintenance. Cash in the hands of the county treasurer and unapplied credits from prior years will about liquidate the deficit.

Adequate credit at reasonable rates of interest is difficult to obtain. The Federal land bank has made a few loans in the Montana district, but none in North Dakota, which is within the jurisdiction of the St. Paul bank. Those who have unimproved farms, and who are in the greatest need of assistance can not get Federal aid. Local loans can be had for short periods at 10 per cent interest.

Engineering.—Construction of the drainage system progressed satisfactorily and two additional contracts were let during the year. Fifteen miles of drain were completed, and an additional 17 miles is under contract for construction. Continuation of drainage construction as fast as funds can be made available is urgently needed.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

Economic.—The water supply was ample for all irrigation requirements, but weather conditions were unfavorable for the production of crops.

In July, 1927, all of the remaining irrigable land on the project was opened for entry, 122 farm units being made available. Applications were received from 257 prospective settlers and all of the land was allotted to applicants. The entrymen established residence and have begun the development of the land.

The North Platte Valley Dairy Development Association was organized for the purpose of promoting the dairy industry in the North Platte Valley. The report of the association covering the period from its organization to December 31, 1927, shows that loans totaling \$444,575 were made to farmers, 19 carloads, comprising 538 head of dairy cows being placed on 88 farms. Five cooperative cheese factories were operated with very good success. More live-stock feeding was done on the project during the winter 1927-28 than for any other year on record, 75,000 head of sheep and 4,700 head of cattle being fed during the winter. The North Platte Valley Cooperative Poultry Marketing Association shipped 12 carloads of turkeys.

The Lyman, Nebr., sugar factory of the Great Western Sugar Co. was completed and placed in operation in the fall of 1927. Two beet spurs were completed by the Union Pacific Railroad Co. and one by the Chicago, Burlington & Quincy Railroad Co., for hauling beets to the various sugar factories in the valley.

Work was begun by the Union Pacific Railroad Co. on the construction of a branch line to provide direct connection from the North Platte Valley to Cheyenne, Wyo., and Denver, Colo.

Engineering.—The Guernsey Dam and power plant were completed in July, 1927, and the first unit of the power plant was placed in operation. A contract was let for the installation of the second unit which was completed early in January, 1928, when the second unit was placed in operation. A separate contract was let for the construction of a concrete gate house over the north spillway. A concrete gate house was constructed over the operating machinery for the power intake gate. The capacity of the transmission line from the Lingle power plant to Scottsbluff, Nebr., was increased by changing the conductors from No. 6 to No. 1 copper.

NEWLANDS PROJECT, NEVADA

Economic.—There is a tendency toward dividing some of the larger land holdings for small-scale dairying and its allied industries. This is particularly true since the general extension of electrical lines over the project.

The attempt to revive the sugar-beet industry by local people during 1927 was not a financial success. Test plats of beets are being grown in 1928 under the direction of the Holly Sugar Co. and at the end of June looked encouraging.

The established industries on the Newlands project are dairying and poultry raising, which are in a strong position. These industries not only furnish steady employment and a steady income, but supply a market for alfalfa and grains. The average production per cow is increasing. California buyers are constantly in the market for healthy, tuberculosis-free cows, and at the end of June, 1928, had purchased about 1,000 head at an average price of \$135.

The development of small farm flocks of sheep is in a healthy condition and the stock-feeding industry is assuming an important place.

The electrification of the project farms is progressing rapidly and by the end of 1928 a large majority of the farms will be served. About \$125,000 will have been spent by the district in the construction of electrical lines.

The economic condition of the settlers is better than it has ever been. Improvement district bonds sell at par plus accrued interest. Delinquent taxpayers are the exception. The lodges and fraternal organizations cooperated and built a \$60,000 building financed mostly from local sources.

Cooperative buying and selling is increasing, particularly by the poultry, turkey, and wool raisers.

CARLSBAD PROJECT, NEW MEXICO

Economic.—Of the 425 cultivated farms, 137 were cultivated by tenants and 288 by owners. All good farms on the project are occupied. A few new settlers purchased farms. Land sales, however,

were confined principally to purchases by local people. Asking prices for farms range from \$125 to \$300 per acre. Sales were confined to the lower prices. Few farms are for sale, except to reduce large holdings. Farming operations during the year were successful, and important progress was made in placing the entire community on a sounder economic basis. The people on the project generally are very much encouraged and satisfied with their farm investments.

Engineering.—A great need for an increased water supply for project lands has existed for several years. As a result of favorable engineering and geological investigations money has been appropriated by Congress to commence construction of a larger reservoir to meet the needs of the project.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

Economic.—Of the 4,669 farms on the Rio Grande project, in 1927, 2,901 were operated by owners and 1,768 by tenants. The average size of the irrigated tract is between 35 and 40 acres, but 50 to 60 per cent of the total number of farms is held in tracts of less than 20 acres, comprising from 10 to 15 per cent of the entire project area. This is due to the large number of holdings held by land owners of Mexican descent in small tracts, and, to a lesser degree, valley homes owned by city dwellers who have occupations other than farming. This explains to a large extent the comparatively large number of tenants, as many owners of small tracts lease other lands and farm them with their own. There are also many tenants, newcomers to the project, who either have insufficient means to buy and farm land or else prefer to rent for a year or two and give farming conditions a thorough tryout before committing themselves to purchase land. Most of the leased lands are owned by project residents. Crop records show an increase of 109 farms during the past year, a fair indication of the number of new settlers who have arrived on the project. No farms have been abandoned. Some large tracts are being subdivided and sold on terms of one-tenth down and one-tenth per year with the same rate of interest. All good farms are occupied, and very few farms are acquired through mortgage foreclosure.

A new cotton compress and fumigating plant was built at Fabens and several additional cotton gins have been built on the project. Small canning plants were established at Mesquite and Mesilla and at Vinton a plant for drying and canning chile was established. These industries have made satisfactory progress and are doing a good business. In El Paso an oil refining plant is being built at an expenditure of \$570,000.

Cotton is now by far the leading crop in value on the project. A strong association for the marketing of this product has been formed, known as the Southwestern Irrigated Cotton Growers' Association.

This association has been successful in establishing a credit of several million dollars with banks in New York City as well as reserve credit with the Federal intermediate credit bank at Houston and El Paso and Dallas banks. There are several cotton finance companies in El Paso loaning money on cotton crops. Local banks also have plenty of money to loan to farmers. The project has practically recovered from the low cotton prices of 1926 when the per acre return was \$60.23, the return for 1927 being \$79.28 and the 10-year average \$64.11. Many luxurious farm homes have been built, and the conveniences of electricity and telephone service are available and adopted. Towns and settlements are close together and the farm bureau locals, the 122 churches, and 80 schools provide places for community gatherings.

Engineering.—During the fiscal year 1928, irrigation and drainage facilities were extended to 1,500 acres in the Rincon Valley; two drainage siphons were installed under the Rio Grande to provide for deepening of main drains at their outlets and a number of secondary drains were constructed. A total of 24.57 miles of drains, 11.43 miles of laterals, and 17.43 miles of levee were built. The Riverside Canal heading and 2.08 miles of canal were built in accordance with the provisions of the 1925 adjustment act.

The principal construction work remaining is the extension of drainage and irrigation features to the Val Verde district, secondary drain construction to areas not effectively served by primary drains and supplementary drainage to areas adjacent to main-drain outlets.

UMATILLA PROJECT, OREGON

East division.—With the elimination of the nonagricultural land, approximately 11,000 acres of classes 1 to 4 land remain in this division. Of this area 8,100 acres paid operation and maintenance charges during the year. The present program provides for specializing in poultry and dairying. Less alfalfa is being sold off the division each year and more is being fed on the farm. The water users are beginning to realize that their only way to succeed is to keep all the fertilizer possible in the soil and to feed their crops on the farm. It is believed that success is possible under this system, as the division enjoys a long pasture season and a good stand of grass will take care of $1\frac{1}{2}$ cows per acre.

West division.—Sixty-two per cent of the present irrigable area is being farmed. Small acreages of melons and small fruits have proved a good source of revenue to part of the project. These crops have been handled successfully by two cooperative producers' associations, located at Irrigon, Oreg. Approximately one-third of the cropped area on very sandy and water-logged land yielded a return for 1927 of less than \$15 per acre.

Collection of construction repayments has been unsatisfactory, nearly 50 per cent of the water users being delinquent for the 1926 charge at the end of the fiscal year.

VALE PROJECT, OREGON

Engineering.—Some inquiries have been received relative to lands to be watered under the irrigation system of the Vale project, but settlement has not been attempted or encouraged, as water will not be available for any of the lands of this project until the spring of 1930.

Approximately 18 miles of main canal are under construction by contract, and a contract has also been awarded for the construction of an additional $2\frac{1}{2}$ miles of the canal, a diversion dam, and 8,470 feet of tunnels, on the contractor's bid of \$443,421.

The field work in connection with the preparation of plans and specifications for $8\frac{1}{2}$ miles of main canal and the lateral distribution system for the Harper and Little Valley units is practically completed and it is expected that this work will be under contract by January 1, 1929.

About 38 miles of drains were constructed for the Warm Springs irrigation district, in accordance with contract dated October 22, 1926. Under the present program this drainage system will be completed by November 1, 1928.

KLAMATH PROJECT, OREGON-CALIFORNIA

Economic.—On the 145 units of public land comprising 8,051 acres in the Tule Lake division opened to entry March 1, 1927, a survey on December 15, 1927, showed that of the 143 entrymen, 96 were residing on their units and 21 others had improvements under construction and that improvements valued at \$128,500 had been completed. On April 16, 1928, nine additional farm units were opened to entry. At the close of the fiscal year six units remained for which qualified applicants had not applied.

Of the 687 cultivated farms on the project 147 were cultivated by tenants, and 540 by owners. The chief cause of tenancy is that lands are held by nonresident owners and large landowners who do not wish to sell at a price sufficiently low to justify purchasing.

An area of privately owned land sufficient to make about 200 fair-sized farms was not cultivated to advantage during 1927 due mainly to land being held in too large ownerships or being owned by absentees. Much of the indifferently cultivated land is within the Langell Valley, Horsefly, and Shasta View irrigation districts. Some of the land is cleared and fenced but only a few farms have permanent improvements of much value.

The various districts are making a greater effort to collect delinquent taxes, and the Federal land bank of Spokane is foreclosing against a few borrowers who are delinquent either in payment of taxes or in payments to the bank.

Land in Langell Valley, Horsefly, and Malin irrigation districts is selling at \$25 to \$40 per acre; and land in the Main division at \$75 to \$150 per acre. Land in the vicinity of Klamath Falls, subdivided into 5-acre tracts, is selling at \$400 to \$1,500 per acre without building improvements. Terms of purchase are generally about one-third at the time of purchase and the balance in 5 to 10 annual installments, bearing 6 to 7 per cent interest. The interest rate on short-time loans is 8 per cent and on long-time loans about 6 or 7 per cent. The Federal land bank makes loans on the better land in the main division and a few small pumping districts near Klamath Falls.

The Malin cheese factory is the only cooperative marketing association vigorously functioning on the project. This factory has been quite successful and during the present year will handle about 5,700,000 pounds of milk and 137,000 pounds of butterfat. The Western Cattle Marketing Association is a cooperative organization which operates in Klamath County and last year did a business of about \$500,000. A poultry growers' association is in the process of organization. A potato growers' association is functioning but its activities are confined mainly to standardizing the product so that only first-class potatoes will be shipped under the brand of the association.

Engineering.—Work on the main drain for the lands in the Clear Lake part of the Langell Valley division was about 65 per cent completed at the close of the fiscal year. In the Tule Lake division enlargement and extension of drains in the 12,000 acres of land that have been opened to entry was completed. Work was also in progress on the extension of the distribution and drainage systems to serve an additional area of 2,000 acres. Investigation of seepage conditions on the main division disclosed that about 12,000 acres are affected and that an enlargement and extension of the present drainage system is needed.

OWYHEE PROJECT, OREGON-IDAHO

The Owyhee project contemplates the irrigation by gravity of 125,000 acres of land in eastern Oregon and western Idaho from the Owyhee River. Of this land 12,000 acres are being irrigated by gravity under the Owyhee ditch, 40,000 acres by pumping from the Snake and Owyhee Rivers, and the balance is in its natural state covered with black sage. Diversion will be effected by means of the Owyhee Dam, a combination diversion and storage structure located at the Hole-in-the-Ground dam site. This dam will be 405 feet high.

It will be above ordinary low water, 232 feet representing the height of diversion, 80 feet the storage space, and 5 feet the freeboard. The available reservoir capacity is 715,000 acre-feet. The entire water supply for the project will be carried for the first 3.5 miles through a tunnel 15 feet in diameter, at the lower end of which it is divided, about 40 per cent being diverted through a tunnel 10.2 feet in diameter to the Gem irrigation district and the remainder being carried on to the north for the irrigation of the rest of the project. The notable features of the canal line to the north are the siphons of considerable magnitude across the Owyhee and Malheur Rivers.

Engineering.—The permanent camp at the Owyhee dam site, including office, eight residences, guest house, water and sewer systems, was established. Diamond drilling, testing, and geological examination of Owyhee dam and reservoir site was completed. Practically all necessary right of way for the reservoir was purchased. Concrete aggregates were located and a standard gauge railroad 24 miles in length from the pit to the dam site was 70 per cent completed. The construction of a 19-mile transmission line and a 13-mile telephone line to the dam site was well under way.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

Economic.—Settlement of the unoccupied farms is making progress, with an increase of 62 resident operators over the low point of 1925. The stimulant is furnished chiefly by the new sugar factory at Belle Fourche, which attracts beet growers located on higher priced lands of other sections. These newcomers are principally tenants, although the project has secured several resident owners of the more substantial type, who are engaged in dairying and other livestock activities. Some 400 farms need building improvements before settlement can advance much further, and to accomplish the desired result a credit fund of \$500,000 should be available to these landowners for constructing the necessary houses and other buildings. No money is available in this vicinity for real-estate loans, and short-time bank loans are made only on productive livestock at 10 per cent interest.

The sugar factory at Belle Fourche, which derives two-thirds of its sustenance from the Government project, has contracted 10,500 acres of beets for the season of 1928, and under average yield this will give the refinery a full-time fall run and, it is estimated, will mean a gross return to growers of \$1,000,000. Five pickle-salting stations in the valley have contracted an average of 65 acres each, which will supply about 50,000 bushels of pickles for the vats. Dairying is making good progress, with an increase of 23 per cent in the number of dairy cows the past year. The Minneapolis Credit Corporation is making small loans to farmers for the purpose of increasing or

establishing dairy herds or sheep, and this is proving an impetus to these industries.

The irrigation district as well as individual farmers realize their obligations to United States, and efforts are being made to meet water payments promptly. In 1927 payments were made on 86 per cent of the area charged, and the delinquency was reduced to 12 per cent in the spring of 1928, because the charges for both years were paid to obtain water service. The new district contract of October 4, 1927, has created a better morale and feeling of permanency in project policy, so that in general required payments are anticipated and met when due. In the calendar years 1926, 1927, and 1928 the district fulfilled all contracted obligations.

Engineering.—Drainage construction began in April, 1928, and at the close of the fiscal year 9 miles of open drains had been completed. The work contracted for construction requires completion of 29 miles during the calendar year 1928. This is approximately one-fifth of the project's drainage needs. About 10,000 acres are affected by seepage, and to reclaim these areas and protect adjacent lands will require a comprehensive drainage system. This construction is provided for in the irrigation district contract of October 4, 1927, wherein provision is also made for replacement of important temporary structures. All cost is to be repaid as supplemental construction.

SALT LAKE BASIN PROJECT, UTAH

The first unit of the Salt Lake Basin project contemplates the construction of the Echo reservoir and the Weber-Provo diversion canal to supply supplemental water to private canal companies in the lower Weber, Provo, Salt Lake, and Ogden Valleys. The land of these companies comprises about 60,000 acres in the lower Weber and Ogden Valleys and 20,000 acres in the Provo and Salt Lake Valleys. The principal crops are orchards, truck gardens, small fruits, and some grain. Contract for the repayment of the construction cost of the first unit was entered into with the association on December 16, 1926. The Weber River Water Users' Association has disposed of 80 per cent of the storage capacity of the Echo Reservoir and is now working on the disposal of the remaining 20 per cent.

Engineering.—Advertisement and specifications for the construction of Echo Dam and the relocation of approximately 5 miles of the Lincoln Highway and Union Pacific Railroad around the reservoir were issued September 25, 1927. Work under the contract covering the railroad and highway was commenced on November 26, 1927, and progressed steadily. At the end of the fiscal year this work was 59 per cent completed. Work under the contract for Echo Dam was started on December 1, 1927, and at the end of June was 11 per cent completed.

OKANOGAN PROJECT, WASHINGTON

Economic.—Practically no new settlers located on the project during the fiscal year. On the contrary, there was a tendency toward centralization of ownership in the hands of a smaller number of the water users by reason of purchasers turning back to the former owners lands which they had purchased on contract and could not pay for.

Existing industries, including the lumber business, are in good financial condition. Mercantile establishments are doing a good business, and bank deposits are the largest in the history of the project, partly due to the pay roll of the lumber mill located at Omak. The economic condition of the settlers is on the whole good. The apple crop for 1927 brought excellent prices and many of the settlers realized very good returns and were able to make a substantial reduction in their indebtedness.

The greatest need of the project is an adequate water supply. Water has been pumped from wells, lakes, the Okanogan River, and from substorage in Salmon Lake Reservoir. Vested water rights have been rented or purchased by water users at a cost to many of from \$20 to \$75 per acre per season. Under an act of Congress approved May 25, 1928, it is proposed to sell the project to the Okanogan irrigation district, with the provision that the area may be reduced to 3,700 acres by the cancellation of water rights, the title to which has been or may be acquired by the district or the county for nonpayment of taxes or assessments. The reduction in area is expected to result in an adequate water supply for the remaining lands. No further expenditures by the Government are contemplated.

YAKIMA PROJECT, WASHINGTON

Economic.—All farms capable of profitable farming under present economic conditions were being cultivated on the Sunnyside and Tieton divisions. Some of the poorer lands and others with high local improvement tax costs were being abandoned and allowed to go to the county and the districts.

A late spring frost in 1927 injured the fruit crops on the Sunnyside division. This and the low price of potatoes in the fall and winter made the financial return of \$61.22 per acre the smallest since 1915.

The total and per acre returns on the Tieton division were the largest for the past 10 years. Apples, the principal crop, brought an average return of \$298.45 per acre. The average value of all crops for the division was \$150.22 per acre.

There has been a considerable addition to the warehouse and cold-storage plant and facilities for handling fruit and other produce.

Kittitas division.—The problem of settlement is recognized and preliminary steps of a preparatory nature are being undertaken by local interests to meet the situation. The clearing of timber and sagebrush from part of the privately-owned lands is in progress and some owners are planning to vitalize the soil, prior to irrigation, by the growth of green manure crops. It is estimated that about 35,000 acres of private lands within the division are now being farmed, and the essential requirement of these lands consists of the delivery of an adequate supply of irrigation water. The Northern Pacific Railway Co., through its subsidiary, the Northwestern Improvement Co., is engaged in a comprehensive plan for the improvement and subdivision of certain railway lands in the vicinity of Cle Elum. Efforts are also being made to work out a plan for directed settlement and subdivision of lands by topography in the Badger Pocket and Park Creek areas, where fairly compact bodies of public, State, and railroad lands are located.

As the main body of land in the Kittitas division practically surrounds an area which has been successfully farmed under private irrigation systems for a long period of years, the matter of providing financial and other assistance to project settlers is largely one of expansion of existing facilities. The present Kittitas County banks will serve as one source of credit, and farm loans from the local organization of the Federal land bank will undoubtedly be available when water is delivered. A farmers' loan corporation, with a capital stock of \$50,000 and a borrowing capacity of \$500,000 from the intermediate credit bank, was organized recently for the primary purpose of assisting farmers in the purchase of livestock. A savings and loan association, started about a year ago with a paid-in capital of \$3,000, has increased its capital to over \$100,000. The extension service and Kittitas County Farm Bureau are cooperating in a program of assistance to farmers along the lines of agricultural economics, soil fertility, irrigation, and drainage. A cooperative dairymen's association has been operating successfully for a number of years.

Engineering.—Final location surveys were made for the north branch and south branch canals and for laterals under the main canal, south branch canal, and north branch canal above station 841. Location of laterals under the north branch canal between stations 841 and 1234 was under way.

Construction of division 1 (about 4 miles) of the main canal, and clearing and grubbing for laterals for about 4,000 acres of irrigable land under the main canal were completed. Work was in progress on the construction of the Easton Dam, the remaining 22 miles of the main canal, 1 mile of the south branch canal, and 11 miles of the north branch canal, testing of the Yakima River crossing site, and clearing of the flooded area above the diversion dam. Work by

Government forces included the erection of a pipe plant at Ellensburg, and the manufacture of lock-joint concrete pipe units.

Preparations were being made to advertise for bids for construction of the remainder of the north branch and south branch canals, the Yakima River crossing, and laterals under the main and south branch canals.

RIVERTON PROJECT, WYOMING

Economic.—The number of farms and the area of land in cultivation increased about 50 per cent during the fiscal year. All the farms are under the management of their owners. Active preparations were in progress for the farming of an increased area in 1929. Two owners who had not seen their farms for almost 20 years were spending large sums in the development of their holdings. Settlement is still very slow though conditions are improving.

The project lacks 500 or 1,000 acres of alfalfa or sweet clover in one body. It would demonstrate the adaptability of these soils to produce forage crops. Such an area could be subdivided and disposed of to settlers of small means on long terms and at a low rate of interest. This would give sufficient forage for settlers to keep livestock the first year and make an income. Along with this settlers need some financial assistance to help them provide a house and other farm buildings. This should be advanced by some agency on 20 years' time with 4 or 5 per cent interest. Without these aids the progress of settlement will be slow.

All present settlers have faith in the project and their ability to succeed. About 100 farms in private ownership are unoccupied and unimproved. This land is priced at an average of about \$15 per acre. Long-time credits are not generally available. Short-time credits on good security are available at 10 per cent.

Engineering.—Construction of the Pilot Canal was resumed late in the fiscal year and preparations were in progress for pushing this work. Work will be continued on the Pilot Canal system.

SHOSHONE PROJECT, WYOMING

Economic.—The number of cultivated farms was 834, or an increase of 35 over 1926. These farm units were farmed by 343 owners and 241 tenants. No new tenants came to the project. Eighteen non-resident farmers sold their holdings to either tenants or neighboring farmers. Seven new entries were made on the Frannie division and a large number of farm-unit amendments were completed whereby additional land was added to the original units, thus making farms that would support families.

On the Garland division 11 farms were not being irrigated or cultivated through failure of the owners to pay the district charges.

The Frannie division had 18 units that were delinquent in meeting the district assessments. All of these will be disposed of through tax sales in due course.

The development of the new Willwood division has been closely watched by the local people. Until several units had been entered by settlers from other States, very few of the local people would consider farming on the Willwood. Of the 28 units entered, 14 have been by local people.

It is equally evident, however, that the average settler lacks sufficient capital to properly farm the raw land and construct the required buildings. Of the 28 new settlers only three have sufficient capital to place their new farms in condition to produce sufficiently to support the family and pay the construction charges. These settlers can not get loans from the State Rural Credit Commission or the Federal land bank until they secure title and further until their farms are more nearly completely developed. In the meantime, many require better buildings, more implements and livestock. These are essential to increasing farm income.

During the year 12 Federal or State loans were made on the Garland division. Other than on such loans the interest rate remains at about 8 per cent on real-estate loans and 10 per cent on short-time chattel loans.

Shipments of crops and livestock from the project amounted to 2,483 cars. The creamery at Powell manufactured 150,000 pounds of butter and 6,000 gallons of ice cream.

Engineering.—The only construction work in progress during the year was the building of drains to reclaim seeped land on the Shoshone irrigation district. It is estimated \$85,000 will be expended during the fiscal year, bringing the total expenditure to \$108,000. The contract with the Shoshone irrigation district provides for the expenditure of \$315,000. Should there be any requirement for drainage on this division after the fiscal year 1930 it will be done by the district as a part of its operation and maintenance.

NATIONAL PARK SERVICE

TRAVEL

Travel to national parks and monuments reached another new high mark this year. A total of 2,522,188 persons visited national parks and 502,656 visited national monuments during the 1928 season. This total of 3,024,844 is an increase of 227,004 persons, or 8 per cent, over the previous high record established in 1927.

AREA OF NATIONAL PARKS AND MONUMENTS

The total area of national parks was increased to 11,846 square miles during the year, through the establishment of the Bryce Canyon National Park and the addition of small areas to several of the other parks. Through boundary adjustments the area of the Hawaii National Park was increased from 242 to 248 square miles, while 80 acres were added to Lassen Volcanic, 49 acres to the Grand Canyon, and approximately 340 acres to Yosemite National Park.

The total area of national monuments was increased to 3,723.7 square miles. A total of 880 acres was added to the Chaco Canyon, approximately 6 acres to the Aztec Ruins, and 26,240 acres to the Craters of the Moon National Monument.

BRYCE CANYON ESTABLISHED AS TWENTIETH NATIONAL PARK

On September 15, 1928, Bryce Canyon, Utah, formerly a national monument, became the twentieth national park of the system. The new park contains 22 square miles. Authority to give this area national park status was contained in two acts of Congress. The first, approved June 7, 1924, provided for the establishment of the Utah National Park, to include the monument area, upon passing of title to all private lands therein to the Federal Government. The second act, approved February 25, 1928, increased the area to be included in the proposed park and changed the name to Bryce Canyon National Park. Under an agreement reached with the Union Pacific System, which owned the private holdings within the area, its lands were deeded to the Federal Government and title passed to the United States on September 15, automatically creating the park. State lands within the area were exchanged for other lands outside the park boundaries.

NEW EASTERN PARK PROJECTS

Progress was made during the year toward meeting the conditions under which Congress approved the establishment of the Great Smoky Mountains and Shenandoah National Parks. As mentioned in the annual report last year, approximately \$5,000,000 had been pledged toward the acquisition of the necessary land for the Great Smokies project in North Carolina-Tennessee. During the past year the Laura Spelman Rockefeller Memorial agreed to match dollar for dollar all money so secured up to \$5,000,000. It is believed on the basis of appraisals and estimates made by the respective park commissions that a total of \$10,000,000 will be sufficient to acquire the necessary lands, of which over 100,000 acres have already been purchased by the State of Tennessee.

New legislation enacted during the year, based upon a careful examination by a representative of the National Park Service, reduced the minimum area of the land necessary to be acquired for the proposed Shenandoah National Park in Virginia from 385,000 plus to 327,000 acres. The same act included provision for leasing lands within the areas of the proposed Shenandoah and Great Smoky Mountains in the discretion of the Secretary of the Interior for periods of two years to persons and religious and educational institutions. During the year the Legislature of Virginia made an appropriation of \$1,000,000 toward the acquisition of the lands necessary for inclusion in the proposed Shenandoah Park and another \$550,000 was pledged by friends of the movement outside of the State. This is in addition to the \$1,200,000 subscribed by the people of Virginia toward the project several years ago.

INVESTIGATIONS OF PROPOSED PARK AREAS BY SENATE AND HOUSE PUBLIC LANDS COMMITTEES

Under authority of a resolution adopted by the Senate during the last session, a subcommittee of the Senate Committee on Public Lands and Surveys visited Yellowstone, Rocky Mountain, and Wind Cave National Parks and proposed park projects in North Dakota. Officials of the National Park Service accompanied the subcommittee.

A subcommittee of the Public Lands Committee of the House of Representatives, under authority contained in the second deficiency act of May 29, 1928, visited the proposed Ouachita Park area in Arkansas and the Bechler Meadows section of Yellowstone National Park. The latter area has been desired for reservoir purposes by irrigation interests in Idaho, which has been opposed consistently by the National Park Service.

*PROPOSED TRANSFER OF MILITARY PARKS AND MONUMENTS
TO INTERIOR DEPARTMENT*

In pursuance of an agreement between the Secretary of War and the Secretary of the Interior legislation was introduced during the first session of the Seventieth Congress for the transfer of 10 national military and other parks and nine national monuments from the jurisdiction of the War Department to that of the National Park Service of the Department of the Interior. The bill, which passed the Senate on May 10, is expected to receive consideration in the House during the coming year. If transferred, these parks and monuments will be known as "national historical parks."

EDUCATIONAL DEVELOPMENTS

Realizing the importance of directing the growth of educational activities, the Laura Spelman Rockefeller Memorial made available a fund of \$10,000 for the expenses of a number of educators to be appointed by the Secretary of the Interior to make a thorough study of and report on the educational possibilities of the national parks. This work has been started. Field studies were made during the summer and definite recommendations will be made after all the facts collected have been discussed in detail.

Through the American Association of Museums the Laura Spelman Rockefeller Memorial granted the sum of \$118,000 for the construction of museums in Yellowstone National Park. Construction has already been started on a museum and auditorium in the Old Faithful section of the park, and further plans call for a new museum in the headquarters group at Mammoth Hot Springs, and several smaller buildings at other points in the park.

The value of maintaining libraries in national parks has been demonstrated by the use made of the library maintained at the Yosemite Museum. Through the interest of officials of the American Association of Museums, the American Library Association became interested in this project during the year, with the result that a committee was appointed to establish libraries in the parks. Already a number of books have been received for park library uses, and efforts will be made to secure more during the winter.

The Yosemite Field School of Natural History completed its fourth successful annual course in 1928. The term lasted six weeks, with an enrollment of 20 students, the maximum number that can be handled with the existing personnel. The students of this school receive training that prepares them admirably for conducting nature guiding activities.

The observation station and trail-side museum at Yavapai Point, Grand Canyon National Park, constructed with funds donated over

a year ago through the cooperation of the American Association of Museums, the Laura Spelman Rockefeller Memorial, the Carnegie Institution, and similar organizations was formally dedicated on July 19. Dr. John C. Merriam, of the Carnegie Institution, and Dr. Fred E. Wright participated in the dedication ceremonies.

ARCHEOLOGICAL INVESTIGATIONS

Archeological investigations were continued in the Mesa Verde National Park by Jesse L. Nusbaum, superintendent of the park and archeologist for the Department of the Interior. The work included excavations at an early pueblo burial mound in the southern portion of Chapin Mesa and investigations at Wetherill Mesa on the western side of the park. Over 40 restorable jars and bowls were uncovered at the two sites, and these will be added to the museum collection after restoration.

Archeological work was also carried on in several of the southwestern national monuments containing prehistoric ruins. The American Museum of Natural History conducted explorations at the Aztec Ruins National Monument and presented a nucleus of museum material to the monument. Studies at the Gran Quivira National Monument were conducted by the School of American Research at Santa Fe, as in past years.

The department archeologist cooperated with the superintendent of southwestern monuments and various monument custodians in planning repair and preservation work.

PROTECTION OF PARK FORESTS

All possible protection against the ravages of insect infestations and fires was given the magnificent stands of timber in national parks. Although the past season was generally very dry and the fire hazard unusually great throughout the national park system, no serious fire damage occurred within the parks. This was primarily due to the vigilance of park forces which cooperated with the adjoining national forest authorities in subduing conflagrations before they reached park lines. A fire control expert was appointed during the summer, who made field studies of fire conditions in Sequoia, Yosemite, and Glacier National Parks for the purpose of working out adequate fire-fighting plans. Insect control work in several of the parks was carried on in cooperation with the Bureau of Entomology of the Department of Agriculture.

CONDITION OF PARK ANIMALS

Wild animal and forage conditions throughout the national park system generally were good during the past year. Hunting of game in Mount McKinley National Park, Alaska, by prospectors and miners

when actually in need of food, was permitted in the organic act establishing the park. Abuse of this privilege, however, added greatly to the difficulties of park administration, and constituted a drain on the wild-animal herds. Upon recommendation of the department this provision of the organic act was repealed during the last session of Congress.

FISH-PLANTING OPERATIONS

The planting of fish in the lakes and streams of the various national parks was continued through cooperation with the Federal Bureau of Fisheries and several State hatcheries.

The construction of the new hatchery station at Lake Yellowstone in Yellowstone National Park, toward which \$15,000 was donated last year by William E. Corey of New York, was begun during the summer and should be in readiness for use in the season of 1929. The Bureau of Fisheries allotted an additional \$15,000 toward the cost of this layout.

An interesting experiment in Glacier National Park this summer was the introduction of golden trout in one of the lakes. This species of trout is a native of the High Sierra and the lakes tributary to the Kern River of California.

PARK ROAD DEVELOPMENT

Congress last year approved base plans for the development of adequate road and trail systems in the national parks on modern standards which call for the ultimate expenditure of \$51,000,000, in addition to the total of \$9,000,000 previously appropriated. Upon the basis of these plans Congress increased the authorization for park road construction from \$2,500,000 to \$5,000,000 annually.

The 1929 Interior Department appropriation act carried a cash appropriation of \$2,500,000 for such construction, of which \$1,500,000 was to cover contractual authorizations contained in the 1928 act. In addition the act authorized the Secretary of the Interior to incur obligations and enter into contracts for additional work not exceeding a total of \$4,000,000. Under this authority projects have been approved for construction and contracts let or prepared for approximately that sum.

Under the stimulus of the enlarged park road program the betterment of park approach roads has gone forward steadily under State and Federal aid.

DEVELOPMENT OF OTHER FACILITIES FOR TOURIST USE

As the improved roads bring in additional motorists each year, heavier patronage of the public automobile camps follows. To meet this growing use the National Park Service improved its camp grounds during the last year and where necessary developed others.

The public-utility operators in the various national parks rendered excellent service during the past year, in most cases handling larger crowds than ever before. Hotel, lodge, and transportation accommodations and facilities were improved and enlarged.

The most important public-utility development of the year was the construction of the new Grand Canyon Lodge at Bright Angel Point on the north rim of the Grand Canyon. The layout, consisting of central lodge and 120 adjacent two-room sleeping cottages, was installed under contract by the Utah Parks Co., a subsidiary of the Union Pacific System. The new lodge was dedicated on September 14.

Tentative plans have been drawn up for the construction of a new all-year, fireproof hotel in Paradise Valley, Mount Rainier National Park.

WINTER USE OF NATIONAL PARKS

A steady growth in the winter use of the national parks during the past half dozen years culminated last winter in the heaviest travel yet experienced. Eleven of the national parks and several of the southwestern monuments were open during the winter.

Negotiations are now in progress toward securing for Yosemite National Park the winter sports events of the Olympiad, which is to be held in Los Angeles in 1932.

APPROPRIATIONS AND REVENUES

Appropriations for the national parks and monuments for the fiscal year 1928 amounted to \$4,889,685. Revenues derived from the national parks and monuments during the same year amounted to \$808,255.81, an increase of \$104,406.21 over the 1927 revenues.

GIFTS TO THE NATIONAL PARK AND MONUMENT SYSTEM

Numerous gifts to the national park and monument system of lands, funds to purchase lands or equipment, and museum material were made during 1928. Contributions in cash amounted to \$32,697.57. In addition gifts of money, including \$5,000,000 from the Laura Spelman Rockefeller Memorial toward the Great Smoky Mountains project, have been made toward the establishment of proposed eastern national parks.

OFFICE AND FIELD ADMINISTRATION

The Washington office work of the National Park Service was kept current during the year and much constructive work was done. The appointment of several new officers and employees, the reallocation of others, and the expansion of quarters were important developments, making toward higher efficiency. A high standard has been maintained also by the field personnel.

COOPERATION WITH OTHER FEDERAL BUREAUS

In accordance with its long-established policy, the National Park Service availed itself whenever possible of the scientific and technical resources of other Government bureaus in solving special problems. All of the bureaus approached for assistance extended the heartiest cooperation. The Bureau of Public Roads of the Department of Agriculture handled major road construction for the service, and the Forest Service, the Bureau of Entomology, and the Weather Bureau of the same department furnished helpful aid. The Public Health Service of the Treasury Department continued its valuable aid in connection with sanitary problems in the parks, and the General Accounting Office of that department helped materially in simplifying accounting procedure. Other cooperating bureaus were the Bureau of Fisheries of the Department of Commerce, which assisted in stocking park waters with fish, and the Geological Survey and General Land Office of this department. The Department of Justice, Post Office Department, and Alaska Road Commission all contributed assistance.

PUBLICATIONS AND MAPS

A total of 583,250 free publications was prepared and distributed during the year. An allotment of \$27,000 of Government funds was available for printing and binding, and private donations amounting to \$2,261.41 were also made for printing. Owing to the widespread interest and numerous inquiries received, larger printing and binding appropriations are needed to enable the Park Service to meet all requests for free information.

In addition to the booklets, 148,000 automobile guide and other maps, 350,800 automobile windshield stickers, and 53,110 fire-warning posters and stickers were issued.

The new edition of the National Parks Portfolio issued during the summer, showed an extraordinary increase in sales. Supplies of these were placed in the larger parks on a consignment basis and receipts turned over to the Superintendent of Documents. A total of 2,500 copies ordered by the Superintendent of Yellowstone National Park for use during the summer was sold in less than a month and further orders placed. Supplies of topographic maps prepared and sold by the Geological Survey were also sent to the parks on a consignment basis, receipts from sales of such maps being turned over to the survey.

TENTH NATIONAL PARK CONFERENCE

The Tenth National Park Conference was held in San Francisco, Calif., February 15 to 21, 1928. Many phases of national park administration were discussed, with special reference to Government

procedure. Particular stress was laid on engineering, educational, personnel, and sanitation problems, while fire control, insect infestation control, and other forest problems were discussed.

YELLOWSTONE NATIONAL PARK, WYO.

The most sensational event of the year in Yellowstone National Park was the breaking out of a new geyser in the Lower Basin. Its crater or outer pit surrounding the vent resembles that of the Old Excelsior which ceased activity in 1888. It is approximately 90 by 140 feet, and the eruption is to a height of 80 to 150 feet every 10 to 14½ hours. The eruptions last from 4 to 6 hours. Dr. Arthur L. Day, director of the geophysical laboratory of the Carnegie Institution, made a special study of this newest and greatest geyser in the park.

Educational activities received new impetus through the donation for museum purposes of \$118,000 by the Laura Spelman Rockefeller Memorial through the American Association of Museums. This will provide for a new museum at headquarters at Mammoth Hot Springs, a branch museum and auditorium at Old Faithful, and several smaller buildings. Construction of the Old Faithful museum was started during the season of 1928 and the building is expected to be ready for occupancy during the season of 1929.

During the summer the park was visited by subcommittees of the Senate and House Public Lands Committees in connection with proposed boundary changes. The Senate subcommittee was unanimously in favor of giving the Teton Mountains and Upper Yellowstone country national park status. The House subcommittee made an investigation of the Bechler River section of the Yellowstone, which Idaho irrigationists are desirous of securing for irrigation purposes.

Under the authority of Congress 28 buffalo were donated to public and private zoological gardens and game preserves, and 23 steers were slaughtered and sold for market purposes. It is the endeavor of the park authorities to keep the Yellowstone herd down to a total of 1,000, the maximum number that it is practicable to range.

Travel during the year reached a total of 230,984, an increase of 30,159 over 1927. In the various automobile camp grounds a total of 506,911 campers were cared for during the season. This figure, of course, includes many visitors who camped at several different camps and were counted each time.

YOSEMITE NATIONAL PARK, CALIF.

Considerable opposition having developed among local interests against the change in the western boundary of Yosemite National Park as recommended in 1926 by the President's Coordinating Com-

mission on National Parks and National Forests, this Commission has withdrawn its recommendation for the boundary change and has opened up the whole matter for further discussion and study. It is hoped that some means may be found by which the privately owned lands within the park may be acquired so that it may not be necessary to move the boundary inward as at first recommended. The Yosemite Lumber Co. suspended logging on its holdings in this area during the 1928 season, but other lumber companies have entered into negotiations with this company and the other large holding lumber company with a view to taking over their holdings. Should this be done logging operations will be resumed at once and if the trees are to be saved it is imperative that action be taken in the near future.

A board of expert advisers was appointed by authority of Congress to study and assist in the solution of problems confronting the service in the management of Yosemite Park. The heavy influx of visitors during the last two years, approaching the half million mark annually, has caused serious congestion and brought about conditions similar to those encountered in a small city. To handle the situation adequately it was necessary that a comprehensive study be made of all problems relating to the use and enjoyment of the park and of the preservation of its natural features. The board of experts met in the park during the summer and secured much data which it has since been studying. Further meetings will be held in the park this fall. The task is an enormous one and considerable time and study will be required to reach a satisfactory solution of all the problems involved.

The medical facilities were taxed to the utmost because of the inadequate and unsatisfactory hospital building. Plans however are now being drawn for a new building, to cost approximately \$45,000, and this will probably be ready for the next summer season.

The paving of the roads on the floor of Yosemite Valley was completed last summer and five bridges under construction will be completed this fall. Contracts have just been let for the Happy Isles Bridge and for the first section of the Wawona Road.

Winter use of the park was heavier during the 1927-28 season than ever before. Negotiations are in progress to secure the holding of the winter sports activities of the Olympiad, which will be held in Los Angeles in 1932, at Glacier Point, where conditions are ideal for such sports.

GRAND CANYON NATIONAL PARK, ARIZ.

One of the most important accomplishments of the year at the Grand Canyon National Park was the opening to the public of Grand Canyon Lodge, built by the Utah Parks Co., a subsidiary of the Union Pacific system, which was dedicated to public use on September 14, 1928, with appropriate ceremonies. The lodge consists of a central

building containing lobby, lounge, dining room, recreation hall, kitchen, and other facilities. Sleeping accommodations are provided by log cabins, each containing two rooms. In addition to 100 standard cabins there are 20 so-called de luxe cabins, each equipped with private bath, porch, and fireplace. Unusual engineering difficulties were involved in the construction of these hotel and related facilities. Among other problems, there was involved the transportation of materials a distance of 200 miles from the railroad and over roads which, due to heavy snow conditions, made travel unusually difficult, especially since construction work proceeded throughout the entire winter. The problem of furnishing an adequate supply of water and electrical energy was successfully met by the construction on Bright Angel Creek of a hydroelectrical plant and a pumping plant by means of which the water from Roaring Springs Creek is lifted against a static head of 3,870 feet to storage tanks on the rim of the canyon.

Two trail developments were of outstanding importance. One was the completion and opening of the Kaibab transcanyon trail affording spectacular views and reaching from rim to rim. The other was the transfer of title to the famous Bright Angel Trail from Coconino County to the Federal Government, after several years of controversy. Immediately upon the taking over of the trail by park authorities the collection of the \$1 toll was discontinued and Government maintenance of the trail was begun. As compensation to Coconino County for the Bright Angel Trail, the United States had previously agreed to reconstruct and improve the Williams approach road to the South Rim, and a contract letting the first part of this work was signed the same day the deed for the trail was accepted.

The construction of the new Kaibab suspension bridge was an important link in the Kaibab transcanyon trail. This bridge, unlike the old one which it replaced, is free from vibration and will accommodate an entire string of pack or saddle animals at one time. Formerly, in using the old swinging bridge, it was necessary for tourist parties to dismount in crossing, the animals being taken over one at a time. This caused congestion and delay at one of the hottest points on the transcanyon trip.

Another bridge which will be of great benefit to many visitors is that now being constructed across the Colorado River at Lees Ferry by the State and Federal Governments. This bridge, which it is expected will be completed and dedicated early next spring, will greatly facilitate park-to-park travel in the Southwest and make possible motor travel between the North and South Rims without long detours through adjoining States.

Travel during the year increased to 167,226, which was 3 per cent more than last year. Especially noticeable was the increase in North Rim visitors, the total number entering there being 18,834.

ROCKY MOUNTAIN NATIONAL PARK, COLO.

Owing to the fact that the Legislature of Colorado meets only biennially nothing was done during the past year toward settling the question of jurisdiction over the Rocky Mountain National Park. A bill for this purpose had been considered in the legislature in 1927. Until this matter is settled it will be impossible to go ahead with the adequate development of the park.

The Fall River Road, the highest road of the park system at an elevation of 11,797 feet, was cut through snow drifts more than 20 feet deep and opened to travel on June 14, a day ahead of schedule. Some 91,000 cubic yards of snow were removed from the roadway, most of the work being done by a steam shovel operating 16 hours a day. Owing to fresh snow on June 17 and 18 the road was again closed but was reopened by noon of June 19. This is the first time in the park's history that the road has ever been closed by fresh snows after June 15. This additional snowfall increased the cost of snow removal. The Rocky Mountain Parks Transportation Co. cooperated in bearing the expense of the snow removal.

A start was made toward the improvement of the trails in Rocky Mountain National Park. This work will have to be continued for several years if the trail system of this park is to be brought up to the improved standard toward which the National Park Service is now working. The popularity of the trails in Rocky Mountain National Park is increasing annually.

The first insect control work to be undertaken in the park was carried on during the spring months against a serious infestation of the Black Hills beetle which is now believed to have been checked.

Winter sports continued to be popular in the park. The Colorado Mountain Club held its annual winter outing at Fern Lake in February with about 80 members present.

A total of 235,057 visitors to the Rocky Mountain National Park was reported for the year.

MOUNT RAINIER NATIONAL PARK, WASH.

Notable progress was made in all lines of endeavor in this park. There was greater attendance, more progress in road, trail, and other developments, and better service provided for visitors. The number of visitors recorded for the year was 219,531, the highest yet experienced.

Tentative plans were drawn for the construction of a new fireproof hotel near the rim of the Nisqually Glacier in Paradise Valley and it is hoped that work on the new structure may be begun next spring, as there is need for additional hotel accommodations at this point. The proposed new hotel will be operated on an all-year basis, whereas the present one may be used only during the summer season.

Study was made of the Yakima Park section, to which a highway is now being built, with special reference to the tourist facilities and developments that will be needed properly to handle the influx of visitors that will follow the completion of the highway. Roads, trails, water supply, and camp and sanitary facilities should all be installed before visitors arrive in great numbers to prevent serious damage to this beautiful section of the park.

With the completion of the Yakima Park Highway and the Naches Pass State Highway, which will connect with it, the Yakima Park area will be opened to eastern Washington and will undoubtedly be heavily patronized by people from this warm section of the State.

The entire north side of the park covering about one-third of the total area, and three alpine park areas in the southwestern portion, have been designated "roadless areas," to remain free of road, hotel, pay camp, and other commercial developments, but open to hikers and horse travel. The areas so designated, together with the large central area to which it is practically impossible to build roads, definitely insure approximately 70 per cent of the total area of Mount Rainier National Park remaining accessible only to hikers or horse travel.

GLACIER NATIONAL PARK, MONT.

Weather conditions during the past two seasons were abnormally wet, resulting in an almost complete absence of forest fires. Several years may elapse before another such season is experienced. It is therefore important that facilities be made available for the quick detection and suppression of fires.

Work on the Avalanche Creek-Logan Pass section of the trans-mountain road was completed late in the summer and this section of highway through spectacular mountain scenery will be open to travel next season. There remain several miles of heavy construction work and some reconstruction before this road across the mountains will be completed.

The portion of the park east of the Continental Divide functions very poorly as a wild-life sanctuary or game preserve. When the eastern boundary was established it was located wholly for the purpose of bounding mineral land which was to be taken out of the Blackfeet Indian Reservation and thrown open to entry under the mining laws. Consequently this boundary, which became the eastern boundary, runs along the shoulders of the mountains and includes no winter range whatever for the elk and deer that range on the eastern slope of the mountains. This game ranges in the higher country within the park during the summer and fall but is forced out of the mountains by storms and deep snow during the late fall and winter. There is no place for it to go within the park and it is obliged to seek

winter range in the lower country in the Blackfeet Indian Reservation across the boundary, where it falls prey to hunters. Deer and elk can not increase in this part of the park until the eastern boundary is extended farther eastward to provide winter range for them. The natural eastern boundary for Glacier National Park is the line of the Blackfeet Highway. By extending the boundary to this line adequate winter range would be provided for all game on the east side. The desired land would, of course, have to be purchased from the Indians.

CRATER LAKE NATIONAL PARK, OREG.

This park enjoyed a highly successful season from every viewpoint. The number of visitors during the year was 38 per cent greater than last year, going into six figures for the first time with a total of 113,323. It is worthy of record, as a commentary upon the attitude and cooperation of the visitors, that there were no forest fires of any moment, no violations necessitating arrests, and no serious accidents.

No major construction work was undertaken for conditions demanded instead a completion program of road oiling, roadside clean-up and bridge construction.

A notable improvement was also made in the rim area. This vital area was opened at its west boundary by the completion of a new road, built on high standards of grade and curvature and emerging at a point on the crater's edge which gives the visitor a first breathless view of the magnificent spectacle. From this point a new road was completed and oiled, thus distributing traffic in turn to the new cafeteria and cabin group, to the camp ground, and to the hotel at the opposite end of a half-mile plaza. On each side of this boulevard an 18-foot parking strip was provided, which will accommodate several hundred cars. Along the very edge of the crater rim a wide asphalt promenade was constructed for pedestrians, and between this dustless trail and the log parapet which limits parking alongside the boulevard there was graded an area of variable width which will be restored to native grasses and wild flowers. The general effect of this development is reducing the dust evil, improving parking and traffic problems, and bettering the landscape.

The simultaneous completion of the new cafeteria and group of rental cabins, together with the new Crater Wall trail taking off from the west end of this area, rounds off this development. The new trail to the lake was constructed on high standards to permit the use of saddle animals, enabling many thousands to enjoy the lake who were heretofore denied that pleasure by physical incapacity.

The park now has 21 miles of new dustless highway from the two main entrances to the rim. A large number of small completion jobs are now practically done, opening a way for reconstruction of the matchless scenic drive around the rim.

SEQUOIA NATIONAL PARK, CALIF.

Excellent progress in clearing up private holdings was made during the year with the purchase of two 160-acre tracts. The Trauger Place on the Mineral King Road was bought for \$3,200, half of which was subscribed by Miss Aurelia S. Harwood, of Upland, Calif., who last year gave \$5,000 to secure the Dean 480 acres. Only a few weeks after this gift, Miss Harwood passed away, and the Sequoia National Park lost one of its warmest friends and supporters. The Camp Lewis property, key to the Kern Canyon, was bought for \$10,000, of which \$4,000 was contributed by the Hon. Robert Woods Bliss, United States Ambassador to Argentina, and \$1,000 by the Sierra Club. Each of these gifts was matched by an equal amount of Federal funds from the special appropriation made for the acquisition of private lands within national parks.

Despite the general falling off in travel to California mountain resorts and parks, the total number of visitors to Sequoia was 98,035, or about a 3 per cent decrease compared with last year. This travel is largely of those coming in their own cars and patronizing the public camps, as train and stage travel is as yet very light.

Further progress was made in construction of the Generals' Highway, which was completed to the Sherman Tree, while construction to Lodge Pole Camp will be finished early in the next year. A trail construction program was begun with the High Sierra Trail from Giant Forest to Mount Whitney as the principal item.

Public automobile camps were extended at Giant Forest and additional sanitary facilities provided. Much progress was made in restoration and protection of landscape, particularly amid the intensively used sequoia groves at Giant Forest.

Further progress was made in the Kern Canyon-Mount Whitney district of 352 square miles added to the park in 1926. In addition to construction of the trail to the summit of Mount Whitney, improvements have been made to tourist pastures and a new ranger station has been built at the south entrance to the canyon.

GENERAL GRANT NATIONAL PARK, CALIF.

Travel increased from 47,996 in 1927 to 51,988 in 1928, despite the fact that tourist travel generally in California was not up to last year's average.

The intensive development of private resorts at Wilsonia, Sequoia Lake, Hume, and other places around the park, together with the fact that it stands alone in a region largely devastated by lumbering, makes it a veritable national oasis in the midst of private interests.

Puncheon fences were built around several of the big trees to protect them from too close approach by visitors. The work done

a year ago at the General Grant Tree is already bearing fruit and the ground under the tree is seeding in grass, flowers, and shrubs. The annual Christmas celebration of the General Grant as the Nation's Christmas tree was attended by over a thousand people.

MESA VERDE NATIONAL PARK, COLO.

The tender by the State of Colorado of jurisdiction over the park was formally accepted by Congress by act of April 25, 1928. Much better control within the area is assured with exclusive control vested in the United States.

All travel records for Mesa Verde were broken when 16,760 people visited the area. This is an increase of approximately 40 per cent over the peak travel of 1927.

The spectacular rim road connecting the Cliff Palace and Balcony House ruins was completed and progress made in relocating two sections of the entrance highway.

The greater part of the development work, however, was centered at park headquarters at Spruce Tree Camp. Government facilities here were improved and extended, and the operators of the public utilities also bettered their service to the public. With the increased travel there is an insistent demand for the erection of a modern hotel in the Mesa Verde.

Work was continued on the second 1-acre water catchment unit to augment the water supply of the park. Owing to subnormal precipitation it has not been possible to make the progress desired, since not sufficient water was available over visitor and camp needs to permit the running of more than one-third of the concrete yardage. The unit will be completed in a short time after sufficient precipitation occurs.

Archeological investigations covering a period of several weeks' work were made by the superintendent, who is also archeologist for the department. With funds donated for the purpose investigations were first undertaken in the fall in a small early pueblo burial mound in the southern portion of Chapin Mesa. This included the uncovering of six undisturbed burials and three others that already had been opened. Fifteen pieces of pottery of early pueblo type were recovered. Early in the spring further studies were made at Wetherill Mesa on the western side of the park. It was from these ruins that Baron Nordenskiöld took the major portion of his comprehensive Mesa Verde collection. Careful troweling for 10 days of the previously worked débris resulted in the finding of nearly 30 restorable jars and bowls, including a large olla, or water jar, far superior to any now in the park museum.

HAWAII NATIONAL PARK, TERRITORY OF HAWAII

During the year three deeds covering holdings within the Hawaii National Park totaling 63,056 acres were conveyed to the United States by the Territory of Hawaii. Of this total 45,926 acres are located in the Kilauea section of the park, connecting this and the former Mauna Loa section, and 17,130 acres in the Haleakala section.

With the completion of the Volcano-Hilo Road last October travel received a fresh impetus and the number of visitors recorded was 78,414, more than double last year's total. A modern concrete highway now stretches from the seaport gateway of Hilo to the park, a drive of 30 miles through delightful surroundings. The Chain-of-Craters Road, begun in April, 1927, was completed and opened to travel just a year later. It stretches eastward for 7 miles from the Crater Road and makes accessible more than 12 wonderful pit and cone craters on the Puna Rift.

Bird Park, an area of beautiful native Hawaiian woodlands, was in the spring protected against stray domestic animals by the erection of a stock-proof fence. By summer this protected area displayed many seedlings of ohia and other Hawaiian trees, while no new growth was noticeable in the area outside the fence.

Development of the natural beauty of the 7 miles of coast that forms the south boundary was begun with the planting of 70 sprouted coconuts and 40 lauhala seedlings on the beach. Fencing was also necessary here because of the wild goats and burros which have been such a pest in this portion of the island. Territorial officials conducted a campaign against the wild goats during the spring, ridding the island of over 1,700 of these destructive animals.

As the final event in the Captain Cook Sesquicentennial celebration a Hawaiian pageant was given at the edge of the pit of Haleamaumau in the Kilauea section of the park. During the hour's performance there was a terrifying roar from continuous avalanches in the huge pit.

LAFAYETTE NATIONAL PARK, ME.

Work on both the motor and carriage road systems made excellent progress during the year. An automobile camp ground, the first to be prepared, was completed during the summer.

A museum of stone-age antiquities, made possible through the interest of the late Dr. Robert Abbe, was erected on private land adjoining the main park entrance and opened to the public. A substantial endowment was provided through the gift of Doctor Abbe and others whom he interested in the project. The museum is in charge of an archeologist who explains to visitors the meaning and probable use of the various relics in the collection.

Travel totaled 134,897, a slight increase over 1927.

ZION NATIONAL PARK, UTAH

The outstanding event of the year was the commencement of construction of the Zion-Mount Carmel Road. This highway, when completed, will connect Zion, the Grand Canyon, and the new Bryce Canyon National Park. The State of Utah is now working at its end of this highway and is also improving a section of the Arrowhead Trail near the Arizona State line.

Travel showed a great increase, with 30,016 visitors as against 24,303 in 1927.

Upon recommendation of the National Park Service seven sections of land were withdrawn from the public domain by executive order pending a study as to the advisability of adding these lands to the park. There is still a further area, not yet withdrawn, that should be considered for addition to Zion. Included in this area are some interesting cliff dwellings as well as spectacular canyon country.

Cheap power for all park operations was made available through the extension of the power lines of the Dixie Power Co. into the park. The Nevada Contracting Co., which is building the Zion-Mount Carmel Highway, financed the building of the necessary power lines.

The public utility operators extended their facilities at Zion Lodge by the erection of a number of new cottages. They also built an unusually well equipped and designed swimming pool.

BRYCE CANYON NATIONAL PARK, UTAH

Bryce Canyon, the newest member of the national park system was dedicated on September 16. Owing to its close proximity to Zion, and its similarity of administrative problems, it will be administered by the superintendent of that park.

HOT SPRINGS NATIONAL PARK, ARK.

The Public Health Service continued the cooperative arrangement whereby one of its medical officers was detailed as superintendent.

The operation of the Government free bathhouse was continued, 6,566 persons being given 98,487 baths during the year, as against 5,699 persons and 87,348 baths last year. The free clinic examined and treated 5,467 patients. The total number of examinations and treatments given in the clinic during the year was 106,692. Of this number 2,872 examinations were for the city board of health. The park also assisted the city of Hot Springs in the physical examination and vaccination of all persons engaged in handling foodstuffs in the city.

The number of visitors is estimated at 199,099. As explained last year, the apparent decrease in visitors during the past two years is not due to an actual decline in the number of visitors but to a revision in methods of estimation so as to arrive at a more accurate travel figure.

Mosquito control work was conducted wherever breeding places were found, particular care being taken to keep the public camp grounds free from mosquitoes.

Nineteen pay bath houses operated during the year, using the hot waters under permit from the department.

MOUNT McKINLEY NATIONAL PARK, ALASKA

Legislation was enacted by Congress repealing the provision of the organic act inhibiting the appropriation of more than \$10,000 annually for maintenance of the park, and also that provision in the organic act which allowed prospectors and miners in the park to take and kill game for actual necessities when short of food. The repeal of the latter provision was in the interest of the park's great herds of caribou and mountain sheep, as much killing was done illegally which could not be controlled.

Road construction work continued to be handled by the Alaska Road Commission under a cooperative agreement. Thirty-four miles of the main park road beginning at the railroad will be in operation this fall.

The public operators improved their facilities and offered improved service to the public. When the present road program is completed a comfortable hotel will be erected at Copper Mountain, to replace the camp now in use there.

In all 802 people visited the park, an increase of 23 per cent over 1927.

LASSEN VOLCANIC NATIONAL PARK, CALIF.

Lassen Park was the center of more electric storms during the past year than ever before since active administration was undertaken by the service. Fire suppression work was carried on under adverse conditions as most of the usually available help was drafted almost continuously to fight the many other fires burning outside the park. No serious damage, however, was done to the park, due to the vigilance of the park forces.

Excellent progress was made in extending the road system within the park, and the approach highway from the south was greatly improved.

This was the banner year for travel to Lassen, with a total of 26,057 visitors.

WIND CAVE NATIONAL PARK, S. DAK.

Wind Cave National Park is poorly developed. If this area is to continue to function as a national park its facilities should be expanded to a point where the needs of the visiting public may adequately be met. Last year 100,309 people visited the cave.

Especially important is the providing of an ample water supply. This can be secured through the development of the present source of supply and the addition of more storage facilities.

The Bureau of Biological Survey of the Department of Agriculture continued to operate a game preserve within the park.

PLATT NATIONAL PARK, OKLA.

A number of people from nearby points visited this reservation during the year, many of them picknickers who stayed only a few hours. In all there were 280,638 visitors. Most of the travel is local, but motorists from nearly every State passed through the area en route west and stopped at the public camp ground.

The Department of the Interior has held the view for many years that this area should be ceded to the State of Oklahoma and operated as a State park.

SULLYS HILL NATIONAL PARK, N. DAK.

Through the cooperation of the Bureau of Indian Affairs the superintendent of the Fort Totten Indian School continued to act as superintendent of the Sullys Hill National Park without compensation. No funds were available for expenditure by the National Park Service in this area nor ever have been. The Bureau of Biological Survey continued to use the park as a game preserve and should have jurisdiction over it. All improvements made during the year were financed from Biological Survey appropriations.

There were 24,979 visitors during the year.

*NATIONAL MONUMENTS UNDER THE CONTROL OF THE
NATIONAL PARK SERVICE*

There are now 32 national monuments under the control of the National Park Service, with a total area of 3,723.7 square miles. The combined travel reached a total of 502,656 persons, the heaviest attendance yet noted. Superintendent Pinkley continued general supervision over the group of southwestern monuments with the exception of Carlsbad Cave, which is in charge of a superintendent who reports direct to the Washington Office.

Repair and archeological investigations were carried on in several of the southwestern monuments. The American Museum of Natural History conducted explorations at the Aztec Ruins National Monu-

ment and presented a nucleus of museum material to the monument, to which interested local people added several hundred specimens. The School of American Research of Santa Fe conducted studies at the Gran Quivira Monument.

The Alaska Road Commission continued its cooperation in supervising all Government activities in the Sitka National Monument. Only part of the cost of maintenance and repair work at Sitka was borne by the Park Service, its funds being augmented by generous allotments of funds from the Alaska Road Commission, the Territory of Alaska, and the Sitka Commercial Club.

It is the hope of officials of the Department of the Interior that it may soon be possible for the various States to take over some of the existing national monuments and operate them as State parks.

THE TERRITORIES

The act of March 1, 1873 (17 Stat. 484), authorized the Secretary of the Interior to thereafter exercise all the powers and perform all the duties relating to Territories that were, prior to March 1, 1873, by law or by custom exercised or performed by the Secretary of State. Under this enactment all the organized Territories created or existing since 1873 have been under the general supervision of the Secretary of the Interior.

ALASKA

The Governor of Alaska, Hon. George A. Parks, in his report for the fiscal year ended June 30, 1928, states that the industrial conditions and the economic situation in Alaska were in general satisfactory. Labor was well employed and there were no widespread epidemics.

While the 1927 fishing season as a whole was disappointing, the production for the early part of 1928 indicates that the catch for this year will exceed all expectations. Although about 93 per cent of the salmon caught are canned, the mild curing, pickling, freezing, and shipping of fresh salmon are none the less important, and the value of these products increases each year in proportion to the total production of the fisheries. In 1927 the mild-curing industry showed a decided increase, the production being the largest on record. This phase of the business is confined almost exclusively to southeastern Alaska. Eighteen plants employed 1,769 people and produced 8,804 tierces, valued at \$1,570,841. Eight plants were engaged in the pickling of salmon, and they employed 108 people and produced 766,400 pounds, valued at \$92,712. The shipping of fresh salmon amounted to 2,217,335 pounds, valued at \$213,995, and the output of frozen salmon was 3,199,034 pounds, valued at \$308,393. Oil and fertilizer, by-products of the salmon industry, were less than in 1926 and were valued at \$26,935 and \$13,650, respectively.

The herring industry continued to decline, as it has in recent years. In southeastern Alaska the production of Scotch-cured herring increased, but the total output of the Territory decreased about 7 per cent. There is much contention over the regulations governing the herring fisheries. A detailed investigation and survey of the herring fisheries in Alaska is in progress, but owing to lack of funds it has not been carried on as rapidly as it should have been.

The production of halibut in 1927 was maintained at a high level as a result of increased efforts and more intensive fishing; 34,491,383 pounds of halibut, valued at \$3,805,088, were caught, and 1,365 people were employed by the industry during the season.

The number of persons employed in the commercial fisheries of Alaska in 1927 was 28,872, an increase of 820 over 1926. The total value of Alaska fishery products in 1927, exclusive of aquatic furs, was \$40,163,300, a decrease of \$14,506,582 from the preceding year, when they were valued at \$54,669,882.

The Bureau of Fisheries estimates that there are 808,870 seals in the herds on the Pribilof Islands. The increase last year was 47,589 or 6.25 per cent. The census statistics indicate that the herds are approximately twice as large as they were in 1917, and during the 10-year period many thousands of skins have been taken and sold by the Government. It is interesting to note that these herds increased from 132,000 in 1911 to more than 808,000 in 1927. When the Government assumed control of the herds they were almost exterminated and could not have withstood the indiscriminate killing for many more years. Under the protection afforded by the treaty they have increased rapidly and now are the source of substantial revenue.

During the year 1927, 24,942 seal skins were taken from the islands and in the same period 20,315 fur seal skins were sold at public auction for a gross price of \$718,101.

Additional revenue was derived from the sale of fox skins taken from the Pribilof Islands. Two hundred and seventy-eight blue and 15 white foxes were taken, and during the year 1,308 blue fox skins were sold for a gross price of \$76,785 and 50 white fox skins brought \$2,387.50.

Under the auspices of the Alaska Roads Commission, the Bureau of Public Roads of the Department of Agriculture, and the Territorial Road Commission the construction of roads and trails in the Territory has made satisfactory progress. At the close of June 30, 1928, the Alaska Roads Commission reported 10,754 miles of roads and trails under its supervision. These consisted of 1,623 miles of wagon road, 1,375 miles of sled road, 7,044 miles of trails, and 712 miles of flagged trails. During the fiscal year 67 $\frac{1}{4}$ miles of wagon road, 171 $\frac{1}{2}$ miles of trails, 96 miles of sled road, 20 airplane landing fields, and 32 shelter cabins were constructed. The total expenditures for this work during the fiscal year amounted to \$1,253,668.81, of which the sum of \$430,923.16 was for new construction and \$822,745.02 for maintenance and improvement.

The mineral production of the Territory for 1927 is valued at \$14,404,000, as compared with \$17,664,800 in 1926. The production of gold decreased from \$6,707,000 in 1926 to \$5,927,000 in 1927, while the value of the copper mined decreased from \$9,489,000 in 1926 to \$7,250,000 in 1927. The gold derived from the lodes increased

slightly over that of the preceding year; therefore the decline in the gold production is due to the reduced output from the placer mines.

The copper mines of the Territory produced 645,000 tons of ore, which yielded 55,343,000 pounds of copper valued at \$7,250,000.

For the first time in many years the production of coal from the mines in the Territory greatly exceeded the importation of this commodity from foreign sources. The total consumption was 166,000 tons, and of this 104,300 tons, valued at \$548,000, were mined in Alaska.

The Katalla oil field in the Bering River district continued to be the only producing field in Alaska.

The Federal Bureau of Mines maintains a fully equipped mine rescue car on the Alaska Railroad. In cooperation with the Alaska Agricultural College and School of Mines, the Bureau of Mines conducts a laboratory in the college where prospectors and miners may have samples assayed at cost and qualitative determinations made free of charge.

The Forest Service of the Department of Agriculture, through an Alaskan branch resident in the Territory, administers 20,000,000 acres of national forest land which has been dedicated by the Federal Government to the continuous production of forest crops. They contain most of the strictly commercial standing timber of the Territory, and are conservatively estimated to have a timber volume of 85,000,000,000 board feet.

The expenditures during the fiscal year for roads and trails in the national forests of Alaska were \$530,340 from Federal sources and \$42,778 from the Territory. The receipts from timber sales, leases, etc., on the national forests for the foregoing period were \$89,767. The total receipts from 1906 to date are \$1,505,808. In 1906 the forests were placed under administration.

Twenty-five per cent of the receipts of the national forests goes to the Territorial Government for public schools and roads.

The estimates of the engineers in the Department of Agriculture indicate that the forests of Alaska may be made to produce 1,300,000 tons of newsprint annually in perpetuity, and that there are available more than 500,000 undeveloped horsepower easily available for timber supply. The companies to which were awarded timber contracts have been making investigations of the projects, and the work is progressing. The outlook for the early development of the pulp and paper industry is most encouraging.

The general manager of the Alaska Railroad reports that the deficit, which last year for the first time in the history of the project was less than \$1,000,000, was reduced to \$840,890. The total commercial tonnage was 96,977 tons, an increase of 14,561 tons, or 17.7 per cent more than last year, while the total tonnage, including railroad freight, increased 6.6 per cent. Revenue passengers to the number

of 51,587 were carried as compared with 53,609 last year, a decrease of 3.8 per cent. The transportation revenue from the rail lines amounted to \$1,151,723.86, which is 7.4 per cent greater than last year.

Surveying and charting the coast of Alaska by the United States Coast and Geodetic Survey was continued during the year, with excellent results. A magnetic observatory and seismological station was maintained at Sitka throughout the year, and primary stations were maintained at Ketchikan, Valdez, and Seward.

The establishment of the Juneau engineer district on April 1, 1921, by the Chief of Engineers, United States Army, has marked a great advance in the manner of handling river and harbor improvements. The improvement of Wrangell Narrows was completed in June, 1928, involving a cost of \$449,153.63. Practically all traffic destined for Alaskan and Canadian points north of Wrangell, now amounting to about 60,000 passengers and 600,000 tons of freight, will use the completed channel where heretofore about half the existing traffic was forced to detour around Cape Decision.

Aviation has progressed in the Territory beyond all expectations. Under the Territorial laws, not to exceed 30 per cent of the Territorial road funds may be expended for the construction of aviation fields, and under this authorization 58 landing places have been constructed. The Territorial legislature provided a subsidy to insure winter airplane mail service to Nome and intermediate points from Nenana. This service was successful and later the Post Office Department authorized air-mail service to several other districts. There are in Alaska four commercial airplane companies operating planes, three in Fairbanks and one in Anchorage.

The Territorial schools are under the supervision of the commissioner of education with headquarters in Juneau. For the biennium 1927-28 the Territorial legislature appropriated \$1,001,350 for the maintenance of Territorial schools and the Agricultural College and School of Mines. The schools are classified in three divisions, namely, schools in incorporated cities and incorporated school districts, schools outside incorporated cities but in established school districts, and special or cooperative schools which are maintained in communities where the number of children of school age does not meet the Territorial requirement for the establishment of a regular district. These schools are supplemented by schools maintained under the direction of the governor out of Federal funds derived from taxes and other sources in Alaska. In the interest of efficient administration these last-mentioned schools are placed in charge of the commissioner of education for the Territory. Approximately \$50,000 is expended annually for this class of schools. During the last year 16 high schools and 90 elementary schools were maintained.

Two hundred and thirty-five teachers were employed for 4,828 pupils at a cost of \$584,892.21.

Illiterate adults in Alaska are afforded an opportunity to improve their condition in citizenship night schools. Seven of these schools were conducted during the year, with an enrollment of 205 students, 180 of whom were men, and 25 women, representing 32 nationalities. Of this number 41 were aliens, 105 had declared their intention of becoming citizens, 17 had applied for full citizenship, and 42 were citizens.

The Agricultural College and School of Mines closed its sixth year in May, 1927. Last year 175 students were enrolled and 40 of this number entered the freshman class. The short courses in mining, agriculture, and home economics were well attended.

In cooperation with the Bureau of Education, Department of the Interior, the college will undertake to train Eskimo boys in the care of reindeer so that they may assume control of their own herds. To meet the demand for summer training for teachers, short courses in education will be given this year. Instructors in the schools of Alaska may attend these sessions. Thereby they avoid the necessity of leaving the Territory as in former years to take such courses. The college is gradually expanding to meet the demand for higher education in Alaska. It is hoped that Congress will extend the provisions of the Hatch and Smith-Lever Acts to the Territory. When this is done the college will receive additional assistance from the Federal Government. The Bureau of Mines and the Biological Survey have experimental stations at the college. The former contributes to a laboratory for ore testing and assaying, while the latter is experimenting with the reindeer in an effort to build up the industry and to improve the conditions of the herds.

Reports from the fur-farming districts in 1926 indicated that many owners were losing animals from unknown causes and in other instances the increase in the number of animals was not satisfactory. The Territory, in an effort to solve these problems and to obtain accurate information on the condition of the industry, engaged an expert veterinarian from the Biological Survey. For the past two years he has been making a detailed investigation of all phases of the situation, and in a short time he will be prepared to submit a plan for improving the industry. It is expected that the Territorial and Federal agencies will cooperate in giving assistance to the fur farmers.

The Alaska division of the Bureau of Education, Department of the Interior, has charge of the education, medical relief, industrial training, and relief of destitution of the natives of Alaska.

During the year 94 schools were in session with 177 teachers and an enrollment of 3,755 pupils. For the same period 5 hospitals, 1 medical boat, 9 doctors, and 24 nurses were employed in the medical

service. In many instances where the local facilities were inadequate patients were taken to Seattle for treatment.

Industrial schools were maintained at Kanakanak, Eklutna, and White Mountain. In these institutions the children are given vocational training and the results that have been achieved more than justify the efforts that have been devoted to this phase of the work. Two years ago a floating hospital was improvised and placed in service on the Yukon River. It has given excellent service, but it is not large enough for the work that is necessary. Last year the doctor and two nurses on the boat treated 1,473 patients other than for dentistry. This year a dentist was assigned to the staff and early reports show his need. The hospital at Tanana is a haven for many tubercular patients, and the results that have been obtained demonstrate beyond question that a very large percentage of the cases may be successfully treated. Tanana is situated in an ideal location for a vocational school and base hospital and should be developed.

The industrial school at Eklutna is the best in the Territory and is an example of what can be accomplished in an institution of this kind under efficient management and with good equipment. The older boys do most of the work around the school; the girls bake bread, make their clothes, and care for the smaller children. The boys have an opportunity to become proficient in blacksmithing, carpentry, taxidermy, tanning of leather, shoemaking, and other useful trades. Additional facilities are required, and they should be furnished.

Every phase of the program of the Bureau of Education is hampered by lack of funds. There are large villages without school facilities; some of them have more than 50 children of school age; many sections are without medical attention of any kind; the hospitals are the best that the limited appropriations will provide, but they are entirely inadequate. It is estimated that there are more than 30,000 natives in Alaska.

There is urgent need for an industrial school for natives in southeastern Alaska. The other industrial schools are crowded beyond their capacity, and it is not practicable to take the students from the southeastern part of the Territory to other sections, even though the schools could accommodate them. They should be given this training in that part of the Territory where they must make their living and in an environment with which they are familiar. Definite estimates for the construction of such an institution have been prepared, and these should receive serious consideration by Congress.

The Bureau of Education exercises administrative supervision over the native reindeer herds. For many years this responsibility was placed on the teachers as a part of their school work. The results were not entirely satisfactory, and last year authorization was obtained for the appointment of a reindeer supervisor whose duty it is to study the many problems and establish the herds on a sound com-

mercial basis. It is realized that until the native owners are competent to manage every phase of the reindeer business the Government can not withdraw its supervision. The commissioner of education and the president of the Alaska Agricultural College and School of Mines have arranged to give a course in reindeer husbandry to a number of Eskimo boys. The Biological Survey is cooperating in this work, and the students will be taken to the experimental station at the Alaska college where they will be taught the necessary principles of herd management and marketing. These boys will receive this training at the expense of the Federal Government.

The Territory has its own fiscal system, controlled by laws enacted by the Territorial legislature. This system has no relation to the revenues received by the Federal Government from business and trade licenses and which are covered into and disbursed from the Alaska fund in the Federal Treasury. The condition of the Territorial treasury for the year ended December 31, 1927, was as follows: Balance of cash on hand January 1, 1927, \$614,010.07; total receipts from all sources, \$1,379,792.20; total disbursements under appropriations made by the Territorial legislature, \$1,221,743.68; balance of cash on hand December 31, 1927, \$772,058.59.

At the close of the year covered by this report there were 13 Territorial and 4 national banks doing business in the Territory. The Territorial banks are located at Ketchikan, Wrangell, Petersburg, Juneau, Skagway, Cordova (2), Valdez, Seward, Anchorage, Iditarod, Nome, and Hyder. National banks are located at Juneau, Ketchikan, Anchorage, and Fairbanks. The number of banks remained the same during the year, no new ones having been organized, nor were any suspended or liquidated.

The Territorial banking board, composed of the governor, the secretary, and the treasurer of the Territory, continued its supervision over the Territorial banking institutions. All such were examined during the year. Reports of their condition were made and statements under call were published, as required by law.

Combined deposits in the several Territorial banks at call of June 30, 1928, totaled \$7,630,190.36 as compared with total of \$7,757,254.02 at corresponding time the year previous. At call of June 30, 1928, combined capital of all Territorial banks totaled \$640,000, the same as for the corresponding call of the year previous. On June 30, 1928, under call from the comptroller, the national banks of the Territory showed combined capital in total of \$275,000, surplus and net undivided profits of \$227,682.19, deposits of \$4,566,319.48. Aggregate banking figures for the Territory on June 30, 1928, were approximately as follows: Capital, \$915,000; surplus and net undivided profits, \$820,250; deposits, \$12,196,500. Approximate totals for the year previous were: Capital, \$840,000; surplus and net undivided profits, \$687,500; deposits, \$12,130.

The Federal Government derives revenue from business and trade licenses issued outside incorporated towns, which is collected by the clerks of the district courts, deposited to the credit of the Treasurer of the United States, and by him credited to the Alaska fund, under the act of Congress approved January 27, 1905. Sixty-five per cent of the money paid into this fund is appropriated for the construction and repair of roads and trails outside incorporated towns and expended under the direction of the Alaska Road Commission; 25 per cent is appropriated for the maintenance of schools outside incorporated towns, expenditures being made upon requisitions by the Governor of Alaska upon the Treasurer of the United States, through the Secretary of the Interior; and 10 per cent is appropriated for the relief of indigents, disbursed by the Federal judges under the act of Congress approved March 3, 1913.

The sums collected during the fiscal year 1927 and a comparison with the previous fiscal year are shown in the following tabulation:

Division 1	1927 2	1928 3	Decrease 4	Cash deposits 5
First.....	\$117, 107. 92	\$48, 221. 59	\$68, 886. 33	\$46, 347. 63
Second.....	3, 583. 97	2, 699. 00	884. 97	2, 699. 00
Third.....	126, 453. 76	101, 834. 61	24, 619. 15	89, 830. 21
Fourth.....	9, 566. 86	8, 383. 26	1, 183. 60	8, 383. 26
Total.....	256, 712. 51	161, 138. 46	95, 574. 05	174, 260. 10

The net amount of cash turned into the Treasury in the fiscal year 1928 for the account of the Alaska fund in the first and third divisions was, however, \$136,177.84, the difference of \$13,878.37 being the aggregate of rebates made and credited to certain salmon canneries for the release of salmon fry in lieu of cash payment of taxes on their output.

The act approved June 26, 1906, provides that the catch and pack of salmon in Alaska by owners of private salmon hatcheries operated in Alaska shall be exempt from all license fees and taxation of every nature at the rate of 10 cases of salmon to every 1,000 red or king salmon fry liberated; that is, a rebate of 40 cents is allowed on every 1,000 red or king salmon fry released.

The total revenues received from the taxes levied by the Federal Government within incorporated towns from business and trade licenses which were paid by the clerks of the district courts directly to the treasurers of the towns were as follows:

Division 1	1927 2	1928 3	Increase 4	Decrease 5
First.....	\$59, 954. 69	\$47, 038. 62		\$12, 916. 07
Second.....	3, 222. 70	4, 083. 45	\$860. 75	
Third.....	17, 188. 23	30, 341. 52	13, 153. 29	
Fourth.....	6, 387. 35	6, 125. 81		261. 54
Total.....	86, 752. 97	87, 589. 40	14, 014. 04	13, 177. 61
Decrease.....			13, 177. 61	
Net increase.....			836. 43	

Agricultural activities in the Territory have made considerable progress during the past year. Attention was centered chiefly around two regions, namely, the Alaska Railroad belt and southwestern Alaska.

With the establishment by the Alaska Railroad of the creamery at Curry, the midway point of the Alaska Railroad, farmers in both the Matanuska and the Tanana Valleys are turning their attention to dairying. In the summer of 1927, cream was shipped from the Matanuska Valley only, but early in 1928 cream was also shipped from the Tanana region.

The Matanuska Valley has climatic conditions similar to those of the Dakotas. Dairy cattle can be housed in barns similar to those now in use in the dairy regions of the States. Silage crops, such as peas and oats, are grown successfully. Oats grow luxuriantly and are used both as a forage and a grain crop.

A network of wagon and automobile roads connects this region with points on the Alaska Railroad. Most of the farmers now in the valley live within 5 miles of a railroad station and find no difficulty in transporting their products.

Dairy products can be produced profitably in this region and the single men are unable to compete with family men in the enterprise, various members of the families helping in the care of the dairy stock.

There are indications that in the not far distant future the chief source of income for most of the farmers will be derived from the sale of dairy products. Good pasture is obtainable for several months during the summer, and winter forage is not difficult to produce. Some of the days in winter are extremely cold. During this time artificial heat must be provided in the dairy barns.

The agricultural region of southwestern Alaska includes the Alaskan Peninsula and the Aleutian and other islands near this peninsula. Grass grows luxuriantly and could be utilized to supply feed for many thousand head of livestock. A number of companies have been organized to raise cattle and sheep, and some of these ventures have proved successful. Among the chief problems confronting the livestock men are transportation and winter feed.

The distance from market is great and the cost of transportation of animals is high. Dock facilities are not available on most of the islands, making it difficult to load and unload livestock on large ocean boats. When the number of animals to be shipped is sufficiently large, it will not be difficult to provide for shipping facilities.

Large areas of grass which can be cut for hay are available. While weather conditions are not always favorable for curing hay, stockmen find no difficulty in obtaining a sufficient quantity to supply their needs.

It is quite apparent that while there have been serious drawbacks to grazing in southwestern Alaska, this industry will ultimately be made a success.

Southeastern Alaska can not be considered an important agricultural region because of topography and general climatic conditions, but it is capable of producing sufficient vegetables and small fruits to meet the demand of a growing population. A limited number of livestock can be raised in a few especially favored localities. Commercial dairying can also be carried on near the towns to a limited extent. With the inauguration of the pulp and paper industry, opportunity will offer for the improvement and intensive cultivation of many small tracts of land in the vicinity of industrial centers.

Agriculture in Alaska probably never will compete with that of the States, but undoubtedly Alaska will in time be able to grow for its own consumption much of the produce now shipped into the Territory from elsewhere.

The legally adjudged insane from the Territory of Alaska have been cared for at Morningside Hospital under contract with the Department of the Interior for a period of 24½ years. During this period there have been admitted to Morningside Hospital a total of 1,211 patients.

There were but 34 patients admitted during the fiscal year 1928, being 12 less than the admission during the fiscal year 1927. The year 1928 shows the smallest number of newly admitted patients in a great number of years.

The annual decrease in the number of patients admitted the past three years is no doubt the result of the strict physical examination of those employed in the fisheries throughout Alaska. This examination was begun during 1926.

There are at present 17 incorporated towns in Alaska, 16 of which have a total assessed property valuation of \$22,690,686.60. The rates of taxation range from 5 to 20 mills.

Mount McKinley National Park, the farthest north national park and second largest park in the United States, was established in 1917. Its area of 2,645 square miles, or 1,692,800 acres, offers protection to uncounted thousands of caribou, mountain sheep, bear, moose, and a large variety of fur-bearing animals. Many species of bird life are also evident, the park area being the only known nesting place of the rare surf bird.

The great increase of fur-bearing animals in the park is evident by the large catches made by trappers in the sections bordering the park.

Under a cooperative agreement with the National Park Service the Alaska Road Commission has charge of the road construction in the park. Thirty-four miles of the main park road from the railroad to Igloo Creek will be in service this fall.

There are three national monuments in Alaska under control of the National Park Service. These are Sitka National Monument, which was established in 1910; Katmai National Monument, established in 1918; and Glacier Bay National Monument, established in 1925.

Very liberal provisions are made by the Territory for the relief of the aged and the indigent, for the rescue and relief of lost persons, for dependent children, and for the pioneers of Alaska. The legislature of 1927 appropriated the sum of \$335,100 for expenditure under the provisions of the various relief measures.

The Pioneers' Home, located at Sitka, is entirely supported by the Territory. Any worthy pioneer who is incapable of self-support, who is qualified by five years' residence in Alaska, may apply to the board of trustees for admission to the home. The inmates are well cared for and the maximum of freedom is allowed them. A complete modern hospital is maintained in connection with the home.

The management of the Pioneers' Home is in a board of trustees, of which the governor is the chairman. This board also passes on applications for allowances, which are granted to indigent residents who are citizens of the United States and who have attained the age of 65 years in the case of men and 60 years in the case of women, and who have resided in the Territory for 15 consecutive years immediately preceding the filing of application. The maximum allowance for women is \$45 and for men \$25 per month.

During the past fiscal year 137 persons were cared for at the home, 43 persons were admitted, 14 were discharged, and 19 died.

The Governor of Alaska makes the following recommendations:

1. A survey by the International Halibut Commission or the Bureau of Fisheries to determine the extent and location of unexplored halibut fishing grounds in the Bering Sea, along the Alaska Peninsula, and in the vicinity of the Aleutian Islands.

2. An investigation by the Bureau of Fisheries to ascertain the condition of the herring fisheries.

3. Investigation by the Territorial agencies discloses that predatory animals—chiefly coyotes and wolves—are destroying wild game and migratory birds and have become a real menace. Immediate action is necessary, and the Territory can not undertake the control without Federal aid. The Federal Government should contribute funds to supplement Territorial appropriations, and to be expended by the Territory in an effort to exterminate the predatory animals.

4. The contract system for the care of the insane from Alaska should be abolished and they should be cared for in a Government institution.

5. The appropriations for the Bureau of Education are not sufficient to enable that organization to provide necessary facilities—educational, vocational, and medical—for all the natives. An industrial school in

southeastern Alaska is necessary, and increased appropriations should be made for new schools in many other sections.

6. In many sections of the Territory the transportation facilities are far ahead of the system of communication. The United States Signal Corps should be given additional funds so that it can establish stations at strategic points.

7. Aviation has advanced to a point where supervision of personnel and equipment is essential to safeguard public interests. The regulations of the Department of Commerce should be enforced in the Territory by competent inspectors.

8. The present policy of sending incorrigible native children out of the Territory is of doubtful wisdom. It would be much better to establish a detention home in Alaska where these cases may be disciplined in the vicinity of their homes and where they will be an example to others.

THE ALASKA RAILROAD

The work of completion and improvement of the railroad was advanced on the somewhat limited scale that the available funds would permit. An estimate presented to Congress in January, 1925, covering a program of work necessary for the completing of the road and providing modern equipment, amounted to \$11,878,781. Expenditures for the objects named in that estimate amounted to \$2,485,784, to the end of the fiscal year 1928, and a large portion of the work remains to be done.

In pursuance of the program of improvements, gravel fills are being substituted wherever practicable, for wooden bridges and trestles; however, where it is necessary to leave an opening for the passage of streams or flood waters, concrete culverts, or steel bridges on concrete piers, have been installed, leaving the roadway in a condition to require a minimum of maintenance work in the future. In addition the track at various points has been raised to improve drainage conditions, and at other places cuts and fills have been widened, or rock has been placed for protection of banks against erosion by streams.

The most important addition to equipment consisted of one Mikado type locomotive, purchased second hand, which was received in September and assembled and repaired in the railroad shops. It was placed in freight service. A small narrow-gauge locomotive, which came from Panama and had been on hand for some years, was altered to standard gauge and is ready for service. A 600-class locomotive was altered to provide 54-inch driving wheels instead of 63-inch, resulting in considerable improvement in the hauling capacity of the locomotive and adapting it to the service required. As a

result of improvement in motive power, due to the operation of larger and more modern engines, the cost of locomotive fuel increased only \$1,455.16, although there was an increase of 2,688,217 in ton miles of freight hauled.

In the operations of the road, a persistent effort was made for the reduction of expenses and increase of revenues. Progress was made in the reduction of the amount of the annual deficit. The deficit for the fiscal year 1927 was \$900,174.67; for the fiscal year 1928, \$840,890.93. There was an increase in operating revenues of \$118,051.76; expenses of maintenance and operation increased \$58,768.02. An increase of \$56,449.96 in bridge replacements charged to maintenance, contributed to the increased total of expenses. The value of material and supplies on hand at the end of 1927 was \$1,096,949.71; at the end of 1928, \$1,218,794.54.

While the question of reduction of forces received constant attention throughout the year no important reductions in the total were made. The increase in experience and efficiency in the personnel permits of the performance of an increased amount of work with slightly decreasing numbers of employees. Pay rolls for 1927 amounted to \$1,856,600, while in 1928 they amounted to \$1,820,466.36, a decrease of 1.946 per cent. The average number of persons employed in 1927 was 953; for 1928 the number is 934.

A baggage car constructed in the Anchorage shops was completed and placed in service in February; two hot cars were completed and put in use; 10 all-steel, 100,000 pounds capacity, self-clearing hopper cars, purchased second hand were received and taken into shop for general overhauling. A narrow-gauge passenger coach was undergoing alterations at the close of the year, being converted to a combination passenger-baggage car. A caboose formerly used as an office car was remodeled inside as a standard caboose and placed in service. Ten additional coal cars were built, using surplus flat cars for underframes.

The steamer *Alice*, purchased from the White Pass and Yukon route in 1927 for operation on the Tanana and Yukon Rivers, was given a general overhauling and remodeling. Passenger carrying capacity was increased by rearrangement of deck and stateroom space, affording 10 additional staterooms. Steam heating was installed, also generator to supply electric lights, and the boat was completely wired. A hydraulic steering gear was installed, replacing obsolete hand-operated gear. Extension was made to power house giving greater visibility to crew; loading spars and power capstans were installed.

The Brill gas-electric car and trailer, received at Seward in late 1927, were placed in regular service, replacing steam train. They were operated continuously during the tourist season and well into

the fall, and then taken out of service for the winter. Another addition to the gas rail equipment during the year was a 25-ton Plymouth gas locomotive, received in September. After assembling, the locomotive was assigned to switching service. After undergoing extensive remodeling, a McKeen gas car, which was purchased second hand from the Reclamation Service, was placed in service in September, on the run between Fairbanks and College, performing satisfactorily all winter, notwithstanding temperatures as low as 60° below zero. A Ford engine driven gas track car, constructed in the railroad shops, was completed in June and placed in service as passenger car No. 116, with seating capacity of 14 persons. This car is designed also to be used as an ambulance in case of emergency. It will fill a long-felt need, as there are occasional calls to make emergency trips to outlying points on the railroad to bring sick or injured persons to Anchorage.

At the end of the calendar year 1925 it was estimated that the road then had 17.2 miles of wooden bridges and trestles. At the end of 1928, there remained 11.75 miles; it is expected that by the end of 1929 the wooden structures will be reduced to a total length of about 10 miles.

HAWAII

The Governor of Hawaii, Hon. Wallace R. Farrington, in his annual report states that the Territory has maintained a steady growth and continued prosperity. Health conditions have been good and there has been a notable decrease in infant mortality. Agriculture has prospered, particularly in the sugar industry. The pineapple crops and the output of coffee find a ready market.

One of the best barometers of the Territory's industrial and commercial progress, the governor states, is the record of payments made to the Federal Internal Revenue Bureau, these moneys being derived largely from the Federal income tax. The payments this year amounted to \$6,244,381.78, a total greater than is paid into the Federal Treasury by 16 sovereign States of the Union.

The population of the Territory is gradually increasing, particularly as to American citizens. In 1927 there were 217,618 of this class and in 1928, 228,276. The number of aliens in the Territory June 30, 1927, was 115,802, and the number of this class for 1928 was 120,491.

The public educational problem has been the typical American one of providing schoolhouses and equipment to meet the increasing demands for education in the public schools and in the Territorial university. This demand has been met and a very high standard is maintained in the schools, practically all additions to the teaching force being supplied by graduates from the Territorial normal and training school and the university.

The movement to equip boys and girls to enter agricultural industries has met with excellent results. The courses in vocational agriculture throughout the public schools have been well attended and will be the commanding feature of the educational situation. The success that has attended the application of science to industry has been so marked in the production of sugar and pineapples that there is every reason to believe that the application of common-sense education in the public schools will accomplish equally gratifying results. The new system of field-cultivation contract, in which the farmer shares in the profit of the industry as a whole, places both sugar cane and pineapple production in a most favorable light before the youth of the islands.

The Honolulu Sewer and Water Commission has brought the water system and sewer equipment of Honolulu to a condition that will properly care for the demands of the growing city. It has made a thorough investigation of the watershed, rainfall, and water resources of the island of Oahu, with special reference to demands that will be made by the growing city of Honolulu. The results of this work have an important bearing on the health of Honolulu and its consequent ability to meet the conditions arising in a port of growing importance in trans-Pacific trade.

Hawaii is keeping faith with the Federal Government in the improvement of deep-sea harbor and port facilities for trans-Pacific commerce. Modern docks, constructed at the expense of the Territory, are available at Honolulu, Oahu; Hilo, Hawaii; and Kahului, Maui, for the service of passenger and freight steamers. It is also spending more than a half million dollars to establish a terminal at Nawiliwili, island of Kauai, where a breakwater has been completed by the Federal Government. When the terminal is finished, every principal island will have a protected harbor with port facilities for the quick dispatch of traffic.

The year 1928 marks the one hundred and fiftieth anniversary of the discovery of the Hawaiian Islands by Capt. James Cook. The period for which this report is written has been devoted entirely to the preparations for the celebration to take place during the month of August, 1928. Through the approval given by the President, the Congress authorized the President of the United States to invite representatives of Great Britain and her dominions in the Pacific to send official representatives to participate in the celebration. This met with favorable response from Great Britain, the Commonwealth of Australia, the Dominion of New Zealand, and the Dominion of Canada. Naval vessels of Great Britain, Australia, and New Zealand were authorized to proceed to Hawaii to participate with ships of the United States in appropriate formal ceremonies. The President approved an act of Congress authorizing the striking of a souve-

nir coin to commemorate the event. The design of this coin carries the bust of Captain Cook on one side and a typical Hawaiian chief on the other. The program in Hawaii has been shaped by a commission, appointed by the governor. The program was designed to recall and honor the great work of Captain Cook; also to suggest the blessings of prosperity and contentment that follow the continuation of the traditional good will prevailing in the Pacific.

The income of the various counties for the fiscal year to June 30, 1928, was \$13,759,714.14, as against \$12,618,826.39, or an increase of \$1,140,892.75 over the income for the prior year. The assessment of property, real and personal, in the Territory aggregated \$390,558,491, as against \$414,064,603 for the prior year. The total revenues collected aggregated \$11,579,668.19; the total expenditures, \$9,579,058.19, the excess of income over operating expenses being \$2,169,951.07.

The total bonded debt on June 30, 1927, was \$24,210,300, which was increased by \$2,750,300 November 15, 1927, and \$50,000 November 15, 1927, issues of 4½ per cent public improvement bonds, and by \$1,575,300 May 15, 1928, issue of 4¾ per cent public improvement bonds. The total bonded indebtedness June 30, 1928, was \$28,585,000, as is shown in the following table:

Date of issue	Term of years	In-terest	Sale	Percent-age basis	Aggregate out-standing	Date due	Where payable, principal and interest
		<i>Per cent</i>					
Aug. 1, 1911...	20-30	4	\$101.5875	3.88	\$1,500,000	Aug. 1, 1941	New York and Honolulu.
Sept. 3, 1912...	20-30	4	100.5887	3.985	1,500,000	Sept. 3, 1942	Do.
Sept. 15, 1914...	20-30	4	100.01	4.00	1,430,000	Sept. 15, 1944	Do.
May 15, 1916...	20-30	4	100.00	4.00	1,750,000	May 15, 1946	Do.
Aug. 1, 1917...	20-30	4	98.04	4.08	1,500,000	Aug. 1, 1947	Do.
Sept. 15, 1919...	20-30	4½	102.814	4.377	1,500,000	Sept. 15, 1949	Do.
Sept. 15, 1920...	20-30	4½	98.01	4.59	2,400,000	Sept. 15, 1950	Do.
Dec. 15, 1920...	20-30	4½	98.01	4.59	200,000	Dec. 15, 1950	Do.
Dec. 31, 1920...	20-30	4½	98.01	4.59	600,000	Dec. 31, 1950	Do.
June 1, 1922...	20-30	4½	103.365	4.25	1,350,000	June 1, 1952	Do.
Oct. 1, 1923...	20-30	4½	99.577	4.52	1,800,000	Oct. 1, 1953	Do.
Do.	20-30	4½	99.577	4.52	75,000	do.	Do.
Apr. 1, 1924...	20-30	4½	99.078	4.56	2,285,000	Apr. 1, 1954	Do.
Oct. 1, 1925...	20-30	4½	101.42	4.39	2,590,000	Oct. 1, 1955	Do.
May 1, 1926...	20-30	4½	103.125	4.27	1,540,000	May 1, 1956	Do.
Oct. 15, 1926...	20-30	4½	103.196	4.26	1,805,000	Oct. 1, 1956	Do.
Jan. 15, 1927...	20-30	4½	104.82	4.18	385,000	Jan. 15, 1957	Do.
Nov. 15, 1927...	Serial.	4½	106.06	3.98	2,750,000	1932-1956	Do.
Do.	20-30	4½	107.22	3.98	50,000	Nov. 15, 1957	Do.
May 15, 1928...	Serial.	4¾	102.37	4.07	1,575,000	1933-1957	Do.
Total...					28,585,000		

Thirty-one banks were in operation at the close of the year. These were distributed as follows: 9 in Honolulu, 1 at Pearl Harbor, 2 at Waialua, and 1 each at Schofield and Waipahu, on the Island of Oahu; 2 at Hilo, 1 at North Kona, 1 at Kealahakua, 1 at Honokaa, 1 at North Kohala, and 1 at Kau, on the Island of Hawaii; 2 at Wailuku, 1 each at Kahului, Paia, and Lahaina, on the Island of Maui; 1 on the Island of Lanai and 1 each at Lihue, Waimea, Kapaa, and Kealia, on the

Island of Kauai. Two are national banks—namely, one at Honolulu, one at Schofield. One of the banks is solely a savings bank, one is solely commercial, and the remainder are both commercial and savings banks.

Bank deposits at the end of the year amounted to \$80,210,063.69, of which \$48,931,629.35 were commercial deposits, and the remainder, \$31,278,434.34, were savings deposits. The savings accounts by races were as follows: Japanese 19.67 per cent; Chinese 16.38 per cent; Hawaiian 7.48 per cent; Portuguese 11.20 per cent; Filipinos 6.69 per cent, and all others 38.58 per cent.

The fire insurance premiums during the year amounted to \$1,279,-625,441.94; premiums paid thereon aggregated \$21,289,291.56, and the fire losses paid aggregated \$2,859,537.49. Marine insurance premiums aggregated \$464,190.99, and the maritime losses \$90,370.71. Life insurance written was valued at \$13,251,568, the premiums paid thereon amounted to \$457,763.67, the renewal premiums were \$3,113,027.69, and the losses paid amounted to \$917,611.81.

During the last fiscal year 86 corporations were created and 34 dissolved, leaving at the close of the fiscal year 1,123 domestic corporations, an increase of 52. The total capitalization of domestic corporations, other than eleemosynary, etc., is \$295,345,098, an increase of \$16,629,000, or 5.6 per cent for the year. Domestic corporations to the number of 19 were dissolved by the Treasurer in accordance with section 3371, Revised Laws of 1925, as amended, for failure to comply with section 3366, regarding filing corporation exhibits. Foreign corporations to the number of 199 are authorized to do business in the Territory. The classes, number, and classification of the domestic corporations now in existence, incorporated before and after the transfer of sovereignty to the United States, are as shown in the following table:

Hawaiian corporations, June 30, 1928

Class	Number		Total	Capital		Total
	Incorporated before Aug. 12, 1898	Incorporated after Aug. 12, 1898		Incorporated before Aug. 12, 1898	Incorporated after Aug. 12, 1898	
Agricultural.....	32	62	94	\$47,930,000	\$71,700,815	\$119,630,815
Mercantile.....	32	644	676	30,195,285	103,393,638	133,588,923
Railroad.....	4	5	9	8,050,000	7,884,960	15,934,960
Street car and transportation.....		2	2		2,730,000	2,730,000
Steamship.....	1	2	3	6,500,000	206,000	6,706,000
Bank.....	1	10	11	1,100,000	3,000,000	4,100,000
Savings and loan.....		22	22		4,228,000	4,228,000
Trust.....	1	13	14	1,250,000	3,486,400	4,736,400
Mortgage and investment.....		21	21		3,340,000	3,340,000
Insurance.....		2	2		350,000	350,000
Eleemosynary.....	34	235	269			
Total.....	105	1,018	1,123	95,025,285	200,319,813	295,345,098

The public lands of the Territory of Hawaii comprise all the remaining portions of the lands which, previous to August 15, 1895, were known as Government lands and Crown lands and any other lands which have been acquired by the Territorial government in any manner since that date. These lands are administered by the commissioner of public lands, under the provisions of section 73 of the Hawaiian organic act, as amended, and include an estimated total area of 1,593,097 acres, classified as follows:

	Acres
Agricultural lands.....	70, 385
Cane lands.....	26, 700
Other agricultural lands.....	40, 461
Rice lands.....	3, 224
Pasture lands.....	620, 696
Homestead lands (unpatented).....	32, 631
Town lots.....	775
Fish ponds.....	350
Reservations.....	32, 517
Forest reservations.....	598, 576
Waste lands.....	237, 167
Total area.....	1, 593, 097

These lands may be homesteaded, sold, leased, or exchanged, in accordance with the provisions of the land laws. Land for homesteading, when first opened, is allotted by drawing and thereafter upon application. Land for home or business sites is sold at public auction. The area of a residence lot may not exceed 3 acres, but the area of a business site may be as large as is necessary for the economical conduct of the particular business. The sale of all Territory lands is restricted to citizens of the United States or corporations doing business in the Territory of Hawaii.

The organic act of Hawaii provided that "all funds arising from the sale or lease or other disposal of public lands shall be appropriated by the laws of government of the Territory of Hawaii and applied to such uses and purposes for the benefit of the inhabitants of the Territory of Hawaii as are consistent with the joint resolution of annexation, approved July 7, 1898.

The total collections by the office of the commissioner of public lands from all sources for the fiscal year July 1, 1927, to June 30, 1928, amounted to \$782,806.22. Of this amount, \$594,473.37 was for land rentals, \$141,738.24 was for sales of public lands, \$39,593.55 was for interest on sales of public lands, and \$7,001.06 was for miscellaneous revenue. The amount of this revenue diverted for the use of the Hawaiian Homes Commission under the Hawaiian Homes Commission act was \$152,559.90.

The population of Hawaii on January 1, 1920, as shown by the Fourteenth Census of the United States, was 255,912. Compared

with a population of 191,909 in 1910 this shows an increase during the 10 years of 64,003, or 33.4 per cent. The population of the Territory was estimated by the board of health to be 348,767 on June 30, 1928, an increase of 92,855 in the eight and one-half years since the Federal census.

The city proper of Honolulu, by the Federal census of 1920, had a population of 83,237, and Hilo, Island of Hawaii, 10,431.

The first census of the Hawaiian Islands was taken in 1832 and was followed by censuses in 1836, 1850, 1853, and 1860. These were very simple and rudimentary in character. There was no provision for taking a census at regular periods until 1865, when the legislative assembly made it the duty of the board of education to make a complete census of the Kingdom every sixth year, counting from the year 1860. These were taken until 1896, and in 1900 the first Federal census was taken.

The population of the Hawaiian Islands by races is as follows: —

Race	1920	1910	Increase since 1910
Hawaiian.....	23, 723	26, 041	¹ 2, 318
Asiatic Hawaiian.....	6, 955	3, 734	3, 221
Caucasian Hawaiian.....	11, 072	8, 772	2, 300
Other Caucasian.....	19, 708	14, 867	4, 841
Japanese.....	109, 274	79, 675	29, 299
Chinese.....	23, 507	21, 674	1, 833
Portuguese.....	27, 002	22, 301	4, 701
Filipino.....	21, 031	2, 361	18, 670
Korean.....	4, 950	4, 533	417
Spanish.....	2, 430	1, 990	440
Porto Rican.....	5, 602	4, 890	712
Negro.....	348	695	¹ 347
All other.....	310	376	¹ 66
Total.....	255, 912	191, 909	64, 003

¹ Decrease.

Hawaii's public-school system is centralized under Territorial control. All public schools are under the direction of the superintendent of public instruction and commissioners appointed by the governor and confirmed by the Territorial senate. Salaries of this department are provided by a specific tax levy based on the number of children enrolled. The total expenditures for public schools in Hawaii, including the teachers normal and training school, for the year ending June 30, 1928, was \$5,741,788.18. This covers salaries and all physical equipment. Public-school buildings for many years past have been and are provided by direct taxation.

Vocational education deals with three main groups of occupations—agriculture, trades and industries, and home making. From the standpoint of the number of people engaged, the field of home making is most important, but from an economic standpoint the work in agriculture seems to head the list. The major crops are sugar cane,

pineapples, and coffee, and courses are planned in the schools to render intelligent assistance in those industries. Fully 12,000 school pupils were employed in agricultural work during the summer vacation of 1927, 4,757 of whom worked for pineapple companies and 5,999 on the sugar plantations. The total of these does not include those who worked at home.

During the year there were maintained 250 schools with 2,738 teachers and 75,931 pupils. There were 65 private schools with 440 teachers and 9,497 pupils.

The following is a comparative table of racial descent of pupils attending the public schools in the Territory on June 30, 1928:

Racial descent	Number of public-school pupils	Per cent of total	Racial descent	Number of public-school pupils	Per cent of total
Hawaiian.....	3,355	5.05	Japanese.....	34,621	52.11
Part Hawaiian.....	7,109	10.70	Korean.....	1,444	2.17
Portuguese.....	5,993	9.02	Filipino.....	2,796	4.21
Porto Rican.....	1,053	1.59	All others.....	671	1.01
Spanish.....	261	.39			
Other Caucasian.....	2,974	4.48	Total.....	66,434	100.00
Chinese.....	6,157	9.27			

The board of health is one of the largest administrative organizations in the Territory, combining as it does under one head health, supervision, and institutional management that is usually split up among three or four separate commissions. Expenditures for the year passing through the board office totaled \$1,197,320.65, affecting 32 separate appropriations.

Health conditions for the year were excellent. The estimated population increase is 15,347. The birth rate was 33.84 per 1,000 population as compared to 37.16 for 1927, the total births being 11,543. The death rate for 1928 was 11.7 per 1,000 population as compared to 11.87 for 1927, the total of deaths being 3,992. The infant-mortality rate was 83.69 as compared to 95.97 for 1927 and 104.21 for 1926. There were 966 deaths of children under 1 year of age, a saving of 214 lives over the preceding year. There were 68 deaths of mothers from puerperal causes for the year, with a rate of 5.72 per 1,000 births and stillbirths. Marriages for the year were 2,736 or 8.02 per 1,000 population, an increase of 140 marriages. Communicable diseases reported show a decrease of 1,559 over the previous year, the total being 4,701, of which 54 were received from arriving vessels. Tuberculosis cases showed an increase of 154 with 4,176 cases reported. Diphtheria cases have increased, with 420 cases and 52 deaths. Forty-four cases of leprosy were reported for 1928 as compared to 67. Twenty patients were examined at Kalihi Hos-

pital and temporarily released. Follow-up of patients on temporary release has been efficiently carried out.

The population of the Territory of Hawaii, as estimated to June 30, 1928, was 348,767, an increase of 15,347. The major single racial increase was in the total Filipinos, which race increased by 7,181 in the excess of arrivals over departures. In American citizenship, the population increased by 10,658, the entire population being estimated as composed of 228,276 citizens and 120,491 aliens. The area distribution, as estimated, shows an urban increase of 6,856 and a rural increase of 8,508 over last period.

Citizen and race classification

	Territory of Hawaii	Cauca- sian	Hawai- ian	Part Hawai- ian	Fili- pino	Jap- anese	Chi- nese	Korean	Others
American citizen.....	228, 276	71, 178	20, 720	25, 984	8, 208	83, 252	15, 058	3, 500	376
Alien.....	120, 491	4, 031			51, 870	51, 348	10, 252	2, 818	172

¹ Nationals.

The number of deaths in the Territory of Hawaii was 3,992, an increase of 63, as compared with 1927. The death rate, estimated as of the mid-year, was 11.70 per 1,000 of population.

The death rates of the Territory for the last five years are shown in the following tables by years, area, and race:

Death rates, Territory of Hawaii, 1924 to 1928

Year	Popula- tion (mid- year)	Total deaths	Death rate per 1,000 popula- tion
1923.....	302, 800	4, 218	13. 93
1924.....	315, 372	4, 017	12. 74
1925.....	326, 045	4, 056	12. 44
1926.....	330, 932	3, 929	11. 87
1927.....	341, 093	3, 992	11. 70

Steady improvement continues in the treatment and control of leprosy. In cooperation with the University of Hawaii and the United States Public Health Service, the Territory has provided added medical care and scientific treatment at Kalaupapa. Services of an eye specialist have continued, also of a specialist to assist in correcting deformities. The general health of the patients has been good. The patients at Kalaupapa number 496; patients at Kalihi Hospital, 164; total 660, or an increase over the previous year of 6. Children at the homes for nonleprous children of leprous patients number 126, a decrease of 6.

Customs receipts by fiscal years since the organization of the Territorial form of government are shown by the following table:

Fiscal year	Amount	Fiscal year	Amount
1900 (half of June)-----	\$45,523.99	1916-----	\$1,161,051.12
1901-----	1,219,618.93	1917-----	1,169,084.80
1902-----	1,327,518.23	1918-----	1,009,243.48
1903-----	1,193,677.83	1919-----	858,258.25
1904-----	1,229,492.15	1920-----	1,172,394.04
1905-----	1,043,404.40	1921-----	1,426,716.32
1906-----	1,218,764.13	1922-----	1,076,163.12
1907-----	1,458,843.48	1923-----	1,500,653.34
1908-----	1,550,157.32	1924-----	1,543,911.06
1909-----	1,396,379.91	1925-----	1,854,403.87
1910-----	1,575,319.15	1926-----	1,748,241.14
1911-----	1,654,761.34	1927-----	1,694,253.77
1912-----	1,643,197.37	1928-----	1,881,787.20
1913-----	1,869,513.89		
1914-----	1,184,416.12	Total-----	40,726,284.38
1915-----	1,019,534.63		

The sources of customs receipts during the year ended June 30, 1928, were as follows: Duties on imports, \$1,804,055.33; fines, penalties, and forfeitures, \$4,489.42; all other customs collections, \$1,567.77; tonnage tax, \$40,925.54; all other commerce collections, \$2,150.14; head tax, \$19,424; all other labor collections, \$1,430; public health, etc., \$7,785; total, \$1,881,787.20.

In the Pacific coast Hawaiian trade the Matson Navigation Co. operates 25 vessels. Its fleet has in all 158,859 gross tons, and offers fortnightly passenger and freight service between Honolulu and San Francisco, Portland, and Puget Sound. The Los Angeles Steamship Co. entered the Hawaiian trade in 1922, and operates four steamers in passenger and freight trade. Sailings are made once a week from Honolulu and Los Angeles, total passenger capacity being 1,409. Oil tankers are operated between Pacific coast and Hawaiian ports by the Associated Oil Co., the Standard Oil Co. of California, and the Union Oil Co. of California.

Honolulu is a regular port of call for steamers of the Dollar Steamship Co. and those of the Admiral Oriental Line. These lines operate a joint service of nine combination passenger and freight vessels from Los Angeles and San Francisco via Honolulu to the Orient, returning direct to Victoria and Seattle.

The Inter-Island Steamship Navigation Co. (Ltd.), established in 1833, owns and operates a fleet of 14 passenger and freight vessels engaged exclusively in the transportation of passengers and freight between ports of the islands in the Hawaiian group. Regular sailings of passenger vessels are maintained from Honolulu five times weekly to various parts of the island. The only commercial dry dock in the island is owned by this company. The dock is of the floating type with a capacity of 4,500 tons. The company has two smaller floating dry docks, one of 3,500 tons lifting capacity and the other of 150 tons.

ELEEMOSYNARY INSTITUTIONS

ST. ELIZABETHS HOSPITAL

This institution was established under the act of March 3, 1855 10 Stat. 682, for the treatment of mental diseases of the Army, Navy District of Columbia, etc.

On June 30, 1928, there were 4,143 patients remaining in the hospital. The total number of patients under treatment during the year was 4,727. The total number of discharges, including deaths, was 584. The daily average population was 4,014, a decrease of 43. The total number of deaths was 189, a decrease of 23, or 12 per cent.

The outstanding events of the year of medical importance were the authorization by Congress of a new medical and surgical building to cost \$875,000. Of this sum \$400,000 was appropriated, leaving the balance to be appropriated at the coming session of Congress. The plans for this building are under way and it is hoped that they and the specifications will be completed so that the contract may be let for construction this winter and may begin as soon as weather permits in the spring. The building will accommodate approximately 200 patients and will house the various professional activities which are now distributed in various buildings, particularly the dispensary service, the dentist, and the syphilotherapy clinic. There will be a well-equipped operating suite with amphitheater and provisions for X-ray equipment, which is now carried in the laboratory. The building will be connected by corridor with R Building (the building at present used for medical and surgical cases), so that there will be direct connection with this building through R Building to the laboratory. It will be located east of R Building, its location having been carefully worked out not only for immediate purposes but with a view of meeting most advantageously the demands of the further growth of the institution. With its occupancy R Building will be used for the more seriously physically ill of what formerly were called infirmary cases, thus raising the quality of care of this type of patient to a modern general-hospital standard. The future growth of the hospital contemplates a new male receiving building facing this building and a female receiving building facing the back of R Building and thus completing the quadrangle. These four buildings, together with the laboratory, will therefore constitute the medical and surgical center of the institution if these plans are realized.

The training school graduated seven nurses and eight psychiatric aides. The affiliated course in psychiatric nursing was continued for students of the Army School of Nursing, Sibley Memorial Hospital, and Homeopathic Hospital. An affiliation was arranged whereby St. Elizabeths Hospital receives students from Emergency Hospital and the George Washington University Hospital schools of nursing. The hospital has affiliation for 3 months with the Children's Hospital, 4 months with Emergency Hospital, 3 months with Sibley Hospital, and 3 months with the Episcopal Eye, Ear, Nose, and Throat Hospital.

The work of the social-service department is gradually increasing and includes not only keeping in contact with paroled patients but making investigations of home conditions of newly admitted patients, also the training of the students of the hospital training school and several students from local social-service schools. In addition to that there has been instituted a mental-hygiene program for the investigation of problems arising in connection with the conduct of employees. This aspect of the work is increasing and is proving a valuable means by which the hospital can assist the employee to an understanding of its problems and an adjustment to its requirements and increase the value of his services to the patients.

The occupational-therapy department has furnished occupation for 915 patients during the year and has turned out 51,345 articles of both industrial and craft work.

The Red Cross continues to furnish valuable aid in welfare work, in the entertainment of patients, in athletics, in reaching the shut-ins and supplying them with delicacies, in meeting the relatives of patients and assisting them to secure quarters while visiting their relatives, and in countless other ways.

The patients' circulating library has increased so that it now has approximately 24,000 volumes. It has outgrown its present quarters, and the building known as The Rest, which was formerly devoted to laboratory purposes, is being remodeled for the use of this library. Its location will make it easy of access and its size will offer added opportunity for reading rooms and consultation of works of reference.

The administrative department reports a prosperous year throughout. Farm and garden products have increased in quantity and value, and the output of the sewing and mending rooms and the other industrial establishments has also increased. The work of remodeling the power, heat, and lighting plant, which was authorized in 1924, has been completed, the equipment accepted, and the old machines removed.

Two years ago the hospital installed an ice-cream plant, and ice cream was added to the regular dietaries as a dessert at least once a week for all patients. During the past year there were 17,344 gallons of ice cream made by this plant.

The superintendent again calls attention to the necessity for adequate legislation to clarify, simplify and modernize the laws which refer to the beneficiaries of the hospital. The general principles involved in this legislation are well recognized and have received additional emphasis in the publication of a very elaborate and learned report by a royal commission appointed to investigate the situation in England and Wales.

In the last annual report of the department, in discussing the subject it was stated that—

During the last session of the Sixty-ninth Congress House bill 17045 was introduced "to amend section 115 (a) of an act entitled 'An act to establish a code of laws for the District of Columbia, as amended.'" This bill, which was prepared in this department, was referred to the Committee on the Judiciary and was pending at the time of the adjournment of Congress. The principal changes and new features in this proposed bill dealing with the insane of the District of Columbia and St. Elizabeths Hospital may be stated briefly as follows:

(1) Provision for voluntary commitment for treatment, on request of patient, with provision for his discharge on three days' notice.

(2) Provision that insane taken into custody by the police or other officials shall not be subjected to trials as are criminals, but may be held in the hospital and treated, and not tried, except upon their request or that of their relatives, guardians, or friends.

(3) If trial is demanded by an insane person, his guardian, or friends, or by order of court, upon petition, the insane person shall be heard by the court and not subjected to a trial by jury unless the insane person, his relatives, guardian, or friends demand it.

(4) Temporary commitment or detention is provided for, with provision that during such temporary commitment, and prior to formal commitment, the person may be released upon certificate to the District of Columbia by the superintendent of the hospital or by two physicians in regular attendance at any other hospital that the person is not insane or has recovered his or her reason.

(5) Provision for the automatic restoration of civil rights of patients discharged from the hospital, on certificate of the superintendent that they are cured or that further treatment is unnecessary or undesirable.

A bill (H. R. 17137) "to regulate the commitment to and discharge from St. Elizabeths Hospital of persons certified by heads of departments and establishments" was likewise introduced in Congress and referred to the House Committee on the Judiciary. In submitting this bill to the chairman of the House Committee on the District of Columbia the department, in a letter dated February 27, 1927, stated that within recent years many writs of habeas corpus have been granted by the courts of the District of Columbia under which patients admitted to treatment in St. Elizabeths Hospital from the Army and other Federal organizations have been released from the custody of the superintendent of that institution. This usually occurs after the patient has been placed in the hospital pursuant to a commitment under existing laws permissible while he still remains in the service of the United States.

The writs in such cases have apparently been granted after the discharge of the patients from the Army or the Federal service and on the theory that they are then in the hospital without proper commitment or ascertainment of condition. Following the granting of these writs the superintendent believes that a number of patients have been released without consideration of their mental condition. In order to remedy this condition and permit the institution to re-

ceive and retain for treatment insane persons so committed to its charge, there has been prepared a form of bill designed to protect the rights of the individual and at the same time safeguard the welfare of the public. The proposed bill declares such commitments to be legal authority for the reception and retention of such patients until cured or released or transferred therefrom by the committing authority. It also provides opportunity for a hearing in respect to the mental condition of such patients in case it be claimed that they are not insane.

HOWARD UNIVERSITY

Howard University was incorporated by the act of March 2, 1867, (14 Stat. 438). The object of the incorporation named in the first section of the act was "for the education of youth in liberal arts and sciences." It is declared the incorporators shall be "A body politic and corporate with perpetual succession." The management and control of the institution was vested in a board of not less than 13 trustees. The full board consists of 24 trustees. One vacancy now exists.

The total enrollment of the university for the year 1927-28 was 2,563 students from 36 States and 14 foreign countries. At the June commencement 245 young men and women received degrees in nine schools and colleges. Three received the degree of master of arts, and upon four the trustees conferred honorary degrees. Three hundred and seventy-three students enrolled in the school of medicine: College of medicine, 235; college of dentistry, 78; college of pharmacy, 60. Of the 235 medical students, 165 held college degrees, one had a master's degree, and 24 were combination students who finished three years of college work. The new building for the school of medicine was ready for occupancy at the beginning of the school year and was dedicated on April 9 and 10. The first floor of the former medical school building has been thoroughly altered and fitted out for a modern infirmary for the college of dentistry. Degrees were conferred as follows: M. D., 52; D. D. S., 17; Ph. C., 17.

There were 91 registrants in the school of law. These students came from 27 States, District of Columbia, and Africa. Thirty-two of them were college graduates. The trustees have voted to begin next year the first year class of a 3-year full time day school, in order to meet the requirements of the American Association of Law Schools. A gift of \$20,000 from the Laura Spelman Rockefeller Memorial provides \$15,000 for bringing the library facilities up to and above the minimum requirements of the American Association of Law Schools and \$1,000 a year for five years to supplement a like sum by the university for the maintenance of the library. Degrees were conferred as follows: LL. D., 16; certificates, 2.

The academic colleges enrolled 1,787 students. This far exceeds the enrollment of last year and is the largest college enrollment in the

history of Howard University. There were 639 new students in the colleges this year, from 195 high schools and 35 States. The new girls' dormitory will be ready for occupancy during the third quarter of the coming year.

The college of liberal arts carries 17 departments of instruction and takes care of all the preprofessional preparation for medicine, dentistry, pharmacy, education, law, social service, engineering, and other applied sciences. The Laura Spelman Rockefeller Memorial this year made a gift of \$10,000—\$9,000 to be used for the immediate purchase of books for the social sciences and \$1,000 to be used for needed periodicals. The General Education Board contributed \$1,700 for special apparatus for the department of zoology. Mr. Julius Rosenwald contributed \$500 toward the salary of an assistant in zoology. The scholarly output in this college during the year includes 1 volume in history, 1 volume in sociology, 1 volume in the drama, and 8 scientific essays in zoology. The head of the department of zoology has been made a member of the editorial board of a new journal, entitled "Physiological Zoology," published by the University of Chicago Press. The total enrollment of this college was 986; graduates, B. A., 31; B. S., 28; B. S. in commerce, 2. Plans are under way for the construction of a new chemistry building which is to cost \$390,000.

The enrollment in the college of education was 741, as compared with 652 last year and 463 the year before. This is a gain of 60 per cent in two years. Of the 741 enrolled, 162 were men and 579 were women. For the first time a graduate student in education was accepted. Officers and teachers of the public schools have conducted a voluntary course of lectures in this college. Degrees were awarded as follows: A. B. in education, 57; B. S. in education, 45.

One hundred and thirty-seven students enrolled for courses in the college of applied science. Eighty-seven of these were registered for degrees. Courses were offered in architecture, art, civil engineering, electrical and mechanical engineering, and home economics. This college shows a 15 per cent increase in registration for electrical engineering and a 40 per cent increase in home economics. The piers of the new Arlington Bridge were set on the basis of calculations made by the assistant professor of civil engineering in this college. Four degrees were awarded as follows: B. S. in electrical engineering, 2; B. S. in home economics, 2.

Sixty-three students enrolled for degrees in the school of music and seven additional special students registered. This school maintains a men's glee club, a women's glee club, and a choir—all three of high caliber, two of them in constant demand for musical services in the community. Graduates find open doors to occupational

success. Three of them won scholarships and fellowships this year, enabling them to do further work on the basis of their excellent preparation at Howard University. Three students were graduated this year with a degree of bachelor of music.

Three graduate degrees were awarded this year. Seven graduate fellows have been appointed for the year 1928-29, 1 in English, 1 in German, 2 in history, 1 in mathematics, and 2 in education. The demand for graduate work increases.

There were registered in the department of physical education 617 men and 392 women. Physical education was required five times a week of all freshmen, sophomores, and juniors. A professional course for the preparation of teachers will be inaugurated during the coming year.

An average of 416 students per quarter received instruction in the department of military science and tactics. Twenty-nine students were awarded commissions as second lieutenants of Infantry, Officers' Reserve Corps, and four students under 21 years of age were awarded certificates of proficiency.

In addition to the regular day classes, the evening classes were conducted again with an enrollment of 539 for three quarters. Two hundred and ninety-three of these were teachers, 95 were government employees, and 151 were in private employment. The work of the evening classes is on the same high level as the work of the regular day classes of the university. After the close of the three regular quarters of the school term, the summer session was again conducted with total of 332 students from 24 States and 4 foreign countries. This number was 106 in excess of the total enrollment in 1926 and more than double the enrollment of the summer school in 1924.

Howard University was incorporated in 1867, but no appropriation was made for its support by Congress until March 3, 1879, when the sum of \$10,000 was appropriated for "maintenance." Since that time Congress has made annual appropriations for the institution, expendable under the supervision of the Secretary of the Interior, who is a patron ex officio of the board of trustees.

The report of the secretary-treasurer covers receipts from all sources, including the Federal appropriations, tuition and other fees, endowments and other investments, rents, donations, etc. The total income for 1928 from all sources was \$787,013.56 and the expenditures were \$783,847.77. For the second time in several years there is no current deficit. On the contrary, economical administration has netted the sum of \$3,165.79 to be applied toward retiring the accumulated deficit. The total assets on June 30, 1928, were \$3,718,867.76. Of this sum the land, buildings, and equipment were valued at \$2,598,-

418.56; \$850,036.70 of trust funds were invested in mortgages and other securities. The balance consisted of \$69,238.95 in the general fund, \$60,585.51 unproductive land, \$209.63 cash in bank, and \$140,378.41 unexpended balance of the appropriation from Congress for the new dormitory building. The property of the university has been accumulated mainly through donations and the sale of and the increase in value of 128 acres of land originally purchased and subdivided by it. The annual congressional appropriation has been made for the payment in part of salaries and for the purchase of supplies, care of grounds, construction of buildings, and other expenses.

FREEDMEN'S HOSPITAL

Freedmen's Hospital was established under the control of the War Department by the act of March 3, 1871 (16 Stat. 506), and transferred to the Interior Department by the act of June 23, 1874 (18 Stat. 223). Prior to the time, however, that it was taken over by the War Department, the hospital was an adjunct of the Freedmen's Bureau which was established 64 years ago, principally for the care of refugees who came to Washington at that time in great numbers.

There were 205 patients remaining from the fiscal year 1927, of whom 38 were pay patients. During the year 4,024 were admitted, making a total of 4,229 indoor patients under care. Of the number admitted, including births, 1,005 were pay patients, nearly one-third of the total admissions; 1,536 were indigent residents of the States; and 1,483 were indigent residents of the District of Columbia. There were discharged during the year 4,054, of whom 1,952 had recovered, 1,467 improved, 338 unimproved, 297 died, leaving 131 in the hospital July 1, 1928, of whom 38 were pay patients. Two thousand three hundred and sixty-one surgical operations were performed on 2,194 persons, 501 received treatment in the dental service, 390 births occurred, and 8,382 special diets were prepared in the dietary department.

For the greater part of the year the wards were filled to capacity. As a result, many applicants applying for medical and surgical aid could not be received. The work was heavy in all departments of the hospital, especially the X-ray, pathological, and out-patient, where the facilities of the institution were taxed to the limit.

In the outdoor department 25,272 applied for treatment in the following clinics: Dermatological, 518; ear, nose, and throat, 1,969; eye, 2,109; gynecological, 1,705; neurological, 759; medical, 1,861; minor surgical, 7,509; urological, 1,529; orthopedic, 1,533; pediatric, 1,560; tubercular, 318; emergencies, 3,902. The number of revisits was 27,334. The total number of patients treated in the outdoor and indoor was 29,501, as against 24,659 the preceding year.

An obstetrical ward is among the most pressing needs of the hospital; this important work is greatly restricted with the present facilities. It is carried on in a ward originally designed for general medical cases and under the handicap of insufficient space and equipment. Under such conditions it is extremely difficult, if not impossible, to render the highest grade and most advanced scientific service. Three hundred and ninety births occurred in this hospital last fiscal year, a sufficient number to more than justify the expense of constructing a modern maternity ward with all the equipment necessary for the proper care of every applicant entering motherhood.

The necessity for a social worker is as urgent as the need for a maternity ward. All leading hospitals, recognizing the necessity of a social-service worker as a valuable means of prevention, spreading, and even curing diseases, have established or are organizing social-service departments. A social worker is the connecting link between the hospital and the community, protecting it against the spread of disease by following the patients to their homes, giving advice as to hygienic living, and bringing back to the follow-up clinic of the hospital delinquent patients, especially those having cancer and tuberculosis.

The hospital is without radium and depends upon the generosity of another hospital in obtaining radium for the most urgent cases. Practically every day a radium case appears for treatment. At least 300 treatments would be given annually if the hospital were in possession of radium.

The work in the school of nursing during the past year showed marked improvement. The added personnel has removed many of the causes, existing heretofore, of embarrassing problems. With the completion of the addition to the nurses' home, for which plans and specifications are now being drawn, and the appointment of the necessary number of pupil nurses, the school of nursing will be in a position to comply with all reasonable requirements of every State nursing board.

The graduating exercises were held June 1, 1928, in the Andrew Rankin Memorial Chapel, Howard University. Eleven nurses graduated, making a total of 450 holding diplomas from the school.

Receipts and disbursements

Receipts:

Appropriation, Interior act—

Salaries.....	\$113, 000. 00
For support.....	75, 000. 00

188, 000. 00

Appropriation, District of Columbia act—(under contract with Board of Public Welfare).....

From pay patients.....	42, 500. 00
	23, 351. 25

Total.....	253, 851. 25
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Disbursements:

Miscellaneous (fuel, light, clothing, medicine, forage, etc.)----	\$71, 177. 32
From pay patients-----	4, 340. 26
Subsistence-----	46, 179. 83
From pay patients-----	10, 811. 85
Salaries-----	112, 552. 86
From pay patients-----	7, 491. 07
Refunds, pay patients-----	645. 25

Total-----	253, 198. 44
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Unexpended balances:

Miscellaneous-----	22. 68
Subsistence-----	120. 17
Salaries-----	447. 14
Pay patients-----	62. 82

Total, unexpended balances-----	652. 81
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COLUMBIA INSTITUTION FOR THE DEAF

During the fiscal year July 1, 1927, through June 30, 1928, there were under instruction in the advanced department of the institution, known as Gallaudet College, 84 men and 60 women, a total of 144, representing 37 States and Canada; this is an increase of 9 compared with the preceding year. In the primary and grammar department, known as the Kendall School, there were under instruction 35 boys and 25 girls, a total of 60; this is an increase of 4 compared with the preceding year. Of the total in this department, 53 were admitted as beneficiaries of the District of Columbia. There were admitted to the institution 34 males and 36 females; discharged, 31 males and 23 females.

In the advanced department the history of education of the deaf has been substituted for the study of logic for the college year. Otherwise the course of instruction remained unchanged. There is a considerable demand for vocational courses, and architectural and advanced mechanical drawing should be provided in the advanced department for young men and courses in office practice and business methods for young women. An additional teacher for speech and auricular training is also needed, or three additional instructors in all.

A special committee on the problems of the deaf has been appointed by the National Research Council to consider questions presented by educators of the deaf. The committee will plan a tentative research program for improving the curricula, teacher training, and methods of instruction for the deaf, as well as suggest aids for many of their problems. The president of this institution has been made a member of this committee, and chairman of the subcommittee on training of teachers of the deaf.

On commencement day there were conferred 2 honorary degrees of Master of Arts, 6 degrees of Master of Arts in the normal department, 1 certificate of graduation in the same department, 10 degrees of

bachelor of science and 8 degrees of bachelor of arts to deaf graduates in the advanced department known as Gallaudet College.

The needs of the institution are as follows: An increase of free scholarships from 125 to 150 pupils; a new building to house library, class rooms, offices, and other activities; and the revision of the salary scale of employees upward in view of the fact that salaries of civil employees in the District of Columbia are being increased beginning July 1, 1928.

The total receipts of the institution for the current year were \$155,598.10; total expenditures, \$155,063.65; balance on hand, \$534.45.

EXTRA-DEPARTMENTAL ACTIVITIES

AMERICAN ANTIQUITIES

The act of June 8, 1906, entitled "An act for the preservation of American antiquities," provides, among other things:

SEC. 3. That permits for the examination of ruins, the excavation of archeological sites, and the gathering of objects of antiquity upon the lands under their respective jurisdiction may be granted by the Secretaries of the Interior, Agriculture, and War to institutions which they may deem properly qualified to conduct such examination, excavation, or gathering, subject to such rules and regulations as they may prescribe: *Provided*, That the examinations, excavations and gatherings are undertaken for the benefit of reputable museums, universities, colleges, or other recognized scientific or educational institutions, with a view to increasing the knowledge of such objects, and that the gatherings shall be made for permanent preservation in public museums.

SEC. 4. That the secretaries of the departments aforesaid shall make and publish from time to time uniform rules and regulations for the purpose of carrying out the provisions of this act.

Archeological explorations.—The uniform rules and regulations promulgated by the Secretaries of the Interior, Agriculture, and War, pursuant to the above-mentioned act, under date of December 28, 1906, provide (par. 3) that—

Permits for the excavation of ruins, the excavation of archeological sites, and the gathering of objects of antiquity will be granted by the respective secretaries having jurisdiction to reputable museums, universities, colleges, or other recognized scientific or educational institutions, or to their duly authorized agents.

Under the provisions of the above act, the department archeologist, Mr. Jesse L. Nusbaum, who is also superintendent of the Mesa Verde National Park, renders advisory service to all branches of the department, as well as to scientific and educational institutions contemplating archeological investigation upon the public domain under the jurisdiction of the department. This official is also engaged in developing methods for the better protection of the many archeological sites located mainly throughout the Southwest; the prevention of unlawful excavation of these sites; the orderly conduct of work authorized by department permits, and the proper publication of the scientific information derived therefrom.

Permits granted.—During the year 12 permits were granted for the examination, excavation, and gathering of specimens, as follows:

July 6, 1927, Dr. Edgar L. Hewitt, director, School of American Research, Archæological Institute of America, Santa Fe, N. Mex.,

was granted a renewal for three years of permission to excavate the ruins in and about what is known as Puye Mesa on the Santa Clara Indian Reservation in New Mexico, about 10 miles west of the pueblo of that name.

July 8, 1927, the Southwest Museum, Los Angeles, Calif., was authorized to conduct during 1927, excavations and remove antiquities from the Petrified Forest National Monument, located in northeastern Arizona.

September 22, 1927, permission was issued to the University of Utah to excavate several small burial mounds situated in San Juan County, Utah, in the stretch of land between two small adjoining streams, known locally as Whiskers Draw and Butler Creek, this site being about 10 miles directly west of the town of Blanding.

November 3, 1927, the Museum of the American Indian, Heye Foundation, New York City, was given permission to make an archeological reconnaissance in Plumas and Lassen and possibly San Bernardino Counties, Calif., and in Elko, White Pine, Lincoln, and Clark Counties, Nev., on such lands as come under the jurisdiction of the department.

January 31, 1928, the Northern Arizona State Teachers College, Flagstaff, Ariz., was authorized to examine and excavate an Indian ruin located one mile east of Canyon Padre on the National Old Trails Highway, thence one-half mile due north from that point.

April 10, 1928, renewal of premission was issued to the American Museum of Natural History, New York City, to seek and remove fossils from the Hopi Indian Reservation in Arizona during 1928.

April 14, 1928, C. W. Gilmore, curator of vertebrate paleontology of the National Museum, was authorized through the Smithsonian Institution to make an exploration and necessary excavations for fossils in what is known as the Two Medicine formation in north central Montana, on the Blackfeet Indian Reservation.

May 16, 1928, C. C. Willoughby, director, Peabody Museum of Harvard University, Cambridge, Mass., was granted permission to examine the ruins in Sagi Canyon near Kayenta, Navajo Reservation, northeastern Arizona, for the purpose of making models of cliff houses and other remains; also permission to carry on archeological explorations in that portion of southern Utah northwest of the Colorado River in the drainage of the Escatanta, Fremont, Muddy, and Paria Rivers, this region including the adjoining corners of Sevier and Emery Counties, and parts of Wayne, Garfield, and Kane Counties.

May 29, 1928, the State Historical Society of Colorado, Denver, Colo., was authorized to conduct during 1928 and 1929 an archeological reconnaissance in the counties of Montezuma and Dolores, Colo., excluding the Mesa Verde National Park, and sole permission

to excavate in Montezuma County some particular spot that appears promising after sufficient exploration.

June 27, 1928, permission was granted the director Royal Ontario Museum of Paleontology, Toronto, Canada, to send certain members of the staff of that institution to the United States for the purpose of collecting during the summer of 1928 vertebrate fossils in South Dakota and Wyoming, and conducting excavations about 10 miles east of Hatcreek, Wyo., the objects collected to be deposited in the Royal Ontario Museum.

June 30, 1928, permission was issued to Prof. Richard S. Lull, of Yale University, New Haven, Conn., to conduct an archeological investigation of certain caves and volcanic vents located in sections 4, 5, 8 and 9, of Dona Ana County, N. Mex., for the purpose of seeking further specimens of a ground sloth of the genus *Nothrotherium*, one specimen of which was purchased by the university from the finder thereof. In issuing this permit, permanent retention of the purchased specimen was awarded to Yale University, and provision made assuring to the Smithsonian Institution the second best specimen found under this authorization.

In submitting his report upon archeological activities during the year, the department archeologist states that the great increase in motor travel is annually bringing to the southwestern archeological fields thousands of visitors and curio hunters. Because of the tremendous area involved, it has been found impossible, in many cases, to prevent vandalism and "pot-hunting" by these visitors, and the problem of protecting archeological remains upon the public domain has largely become a matter of educating the public to a proper appreciation of the value of scientific investigation as compared with the destructive work of the curio seeker and vandal. In the former case, the information and materials gained are accessible to the public through published reports and museums, while in the latter all benefit to the public is lost. He suggests as an aid in solving this problem that all field employees within that area be impressed with the importance of enforcing the act for the preservation of American antiquities, and of immediately reporting to the department all acts of unlawful excavation. He further suggests that these employees be authorized to apprehend or cause to be arrested, any persons violating this act, and permitted to seize wherever found, any object of antiquity or collection unlawfully obtained. He also expresses the opinion that Indian traders and others operating stores under permit within the public land areas should be prohibited from purchasing or exposing archæological material for sale under penalty of revocation of their license.

GENERAL EDUCATION BOARD

This corporation was created by act of Congress approved January 12, 1903, section 6 of which requires the corporation to annually file with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation, and the expenditure or other use or disposition of the same or the income thereof during the preceding year, and has for its object the promotion of education within the United States.

On June 30, 1928, the principal funds, belonging without restriction to the board, amounted to \$77,885,203.17. This is invested in stocks, bonds, and a mortgage. Of this total \$34,716,828.61 has been appropriated to various educational institutions, including \$12,462,000 appropriated during the year ended June 30, 1928. The sum of \$11,206,696.85 was paid during the year on account of principal appropriations.

The income from the above funds, together with the income from undisbursed income, amounted during the year to \$5,242,433.36. The balance of income from the previous year as of June 30, 1927, amounting to \$14,204,582.64, together with sundry refunds amounting to \$30,234.52, increased the total to \$19,477,250.52.

Disbursements from income during the year were as follows: For whites, \$5,279,105.58; for negroes, \$1,208,458.85; miscellaneous, \$284,383.56; grand total, \$6,771,947.99.

This leaves an undisbursed balance of income on June 30, 1928, of \$12,705,302.53, which is invested as follows: Stocks and bonds, \$2,757,641.76; secured demand loans, \$9,533,874.37; cash, \$208,838.08; accounts receivable, net, \$204,948.32. It should be noted, however, that against this balance there are unpaid appropriations amounting to \$12,024,646.22.

The Anna T. Jeanes Fund, the income to be used for negro rural schools, amounts to \$203,483.80. It is invested as follows: Bonds, \$126,438.80; stocks, \$16,645; secured demand loans, \$60,400. The income from this fund during the year was \$9,366.25. Added to the balance from the previous year, the total available income amounted to \$15,349.96. Of this, \$9,624.33 was appropriated and paid to various schools, leaving a balance of \$5,725.63 in secured demand loans.

THE FUEL ADMINISTRATION AND THE BITUMINOUS COAL COMMISSION RECORDS

Executive order of July 22, 1919, transferred to the custody of the Secretary of the Interior, the records, files, and property of the United States Fuel Administration. On March 20, 1920, an Executive order was issued, authorizing the department to settle claims against the

Fuel Administration, but this authority was terminated on September 3, 1921, under the provisions of the act of March 3, 1921 (41 Stat. 1359), and the settlement of such claims thereafter placed under the jurisdiction of the General Accounting Office, audit division. During the year numerous requests have been received for permission to examine these records, as well as for certified copies thereof, and these have been promptly handled.

A committee was appointed during the year to make an examination of the records of the Fuel Administration with a view to determining whether any of such records could be destroyed. The report of this committee, in accordance with the terms of Executive order of March 16, 1912, was submitted to the Librarian of Congress for the purpose of determining whether any of such papers were of sufficient historical interest to be retained. The report of the Librarian concurs in the recommendation of the committee as to the destruction of certain papers in these files, and accordingly a report will be submitted to Congress when it convenes, under the provisions of the act of February 16, 1889 (25 Stat., 672), covering the destruction of such papers.

THE PERRY'S VICTORY MEMORIAL COMMISSION

The report of the commission for the maintenance and care of the Perry's Victory Memorial on Put in Bay Island, Lake Erie, Ohio, expresses satisfaction with the physical condition of the memorial with respect to preservation.

The memorial continued self-supporting as to all costs of operation and maintenance. The total receipts for the year aggregated \$9,191.74, and the total disbursements for operation, maintenance, and all normal expenses were \$6,858.90. The commission, however, paid \$2,332.84 during the year to meet necessary extraordinary expenses over and above the cost of operation. These expenses were required to cooperate with the Comptroller General of the United States in the investigation of the administration of the memorial proposed by him in October, 1926; payment of principal and interest on contract for changing the drainage system; premium on bond of the special disbursing agent for the appropriation by the Sixty-eighth Congress, and certain items carried under the head of "Publicity," being for photographs, lithographs, and publications descriptive of the memorial, for sale on the premises. These latter expenditures are rightly to be regarded as assets, since the publications to which they were due are sold at a profit, contributing to earnings over a period of years in the future. The cash balance reported as of December 1, 1927, was \$1,791.73.

The memorial is open to the public and receives revenue only from about May 30 to September 10 each year. The summer season of

1928 has not been as prosperous as the average, on account of the continued cold and rainy weather in the Great Lakes region which prevailed up to July 1. The total receipts were \$8,598.25, being \$593.49 less than during the year previous. The net revenue, however, was more than sufficient to meet the cost of operation and maintenance.

The Seventieth Congress at its first session appropriated, in the second deficiency act, \$14,374 to further improve the memorial and promote its economical operation and use by the public, the said appropriation being specifically for two purposes, to wit: "For proper electric lighting of the memorial plazas and grounds, \$7,374; for utility building and storage warehouse, \$7,000; in all, fiscal year 1929, \$14,374."

The contract for the first-named object was awarded under competitive bidding to the Ohio Public Service Co., of Sandusky, Ohio, in the sum of \$7,200. The contract for the utility building will not be awarded until a time appropriate for building operations in the spring of 1929. This delay is due to the fact that the appropriation did not become available soon enough to have the proposed building ready for public use during the summer of 1928, and the commission was disinclined to begin construction during the autumn of that year, lest the building be exposed in an unfinished state to the storms and severe climatic conditions of the region during the winter of 1928-29.

APPENDIX

SERVICE OF SECRETARIES OF THE INTERIOR

Name	When appointed	Whence appointed	President	Length of service
				Yrs. mos. days
1. Thomas Ewing.....	Mar. 8, 1849	Ohio.....	Taylor and Fillmore.....	1 5 8
2. Thomas M. T. McKennan.....	Aug. 15, 1850	Pennsylvania.....	Fillmore.....	-- -- 27
3. Alexander H. H. Stuart.....	Sept. 12, 1850	Virginia.....	do.....	2 5 25
4. Robert McClelland.....	Mar. 7, 1853	Michigan.....	Pierce.....	4 0 0
5. Jacob Thompson.....	Mar. 6, 1857	Mississippi.....	Buchanan.....	4 0 0
6. Caleb B. Smith.....	Mar. 5, 1861	Indiana.....	Lincoln.....	1 10 4
7. John P. Usher.....	Jan. 8, 1863	do.....	Lincoln and Johnson.....	2 4 7
8. James Harlan.....	May 15, 1865	Iowa.....	Johnson.....	1 2 12
9. Orville H. Browning.....	July 27, 1866	Illinois.....	do.....	2 7 10
10. Jacob B. Cox.....	Mar. 5, 1869	Ohio.....	Grant.....	1 7 27
11. Columbus Delano.....	Nov. 1, 1870	do.....	do.....	4 11 19
12. Zachariah Chandler.....	Oct. 19, 1875	Michigan.....	do.....	1 4 25
13. Carl Schurz.....	Mar. 12, 1877	Missouri.....	Hayes.....	3 11 24
14. Samuel J. Kirkwood.....	Mar. 5, 1881	Iowa.....	Garfield and Arthur.....	1 1 2
15. Henry M. Teller.....	Apr. 6, 1882	Colorado.....	Arthur.....	2 11 0
16. Lucius Q. C. Lamar.....	Mar. 6, 1885	Mississippi.....	Cleveland.....	2 10 10
17. William F. Vilas.....	Jan. 16, 1888	Wisconsin.....	do.....	1 1 22
18. John W. Noble.....	Mar. 6, 1889	Missouri.....	Harrison.....	4 0 0
19. Hoke Smith.....	Mar. 6, 1893	Georgia.....	Cleveland.....	3 5 25
20. David R. Francis.....	Sept. 1, 1896	Missouri.....	do.....	-- 6 5
21. Cornelius N. Bliss.....	Mar. 5, 1897	New York.....	McKinley.....	1 11 15
22. Ethan Allen Hitchcock.....	Dec. 21, 1898 ¹	Missouri.....	McKinley and Roosevelt.....	8 0 13
23. James R. Garfield.....	Mar. 5, 1907	Ohio.....	Roosevelt.....	2 0 0
24. Richard A. Ballinger.....	Mar. 6, 1909	Washington.....	Taft.....	2 0 5
25. Walter L. Fisher.....	Mar. 13, 1911	Illinois.....	do.....	1 11 26
26. Franklin K. Lane.....	Mar. 6, 1913	California.....	Wilson.....	6 11 26
27. John Barton Payne.....	Feb. 28, 1920 ²	Illinois.....	do.....	-- 11 20
28. Albert B. Fall.....	Mar. 5, 1921 ³	New Mexico.....	Harding.....	2 -- --
29. Hubert Work.....	Mar. 5, 1923 ⁴	Colorado.....	Harding and Coolidge.....	5 4 19
30. Roy O. West.....	July 25, 1928	Illinois.....	Coolidge.....	-- -- --

¹ Entered on duty Feb. 20, 1899.

² The last day of Mr. Lane's service was Feb. 29, 1920.

³ Entered on duty Mar. 15, 1920.

⁴ Mr. Fall resigned, effective Mar. 4, 1923.

⁵ Doctor Work resigned, effective July 24, 1928.

THE ALASKA RAILROAD

Statement of appropriations and expenditures March 12, 1914, to June 30, 1928

(Act approved March 12, 1914 (38 Stat. 305))

Appropriation of United States Treasury funds:

Construction and operation of railroads in Alaska.....	\$52,000,000.00
Construction and equipment of railroads in Alaska.....	4,864,350.00
Maintenance and operation of railroads in Alaska.....	3,647,400.00
Operation of river steamers in Alaska.....	75,000.00
Printing and binding, Interior Department.....	14,155.06
Increase in compensation.....	23,701.63
Fuel and transportation, Bureau of Supplies and Accounts, 1921 (coal washery).....	243,000.00
Proceeds of sales of town lots in Alaska, act of Apr. 17, 1917 (40 Stat. 19).....	113,117.38
Alaska railroad fund.....	5,500,000.00
Total appropriations.....	66,480,724.07

Other available resources:

Book valuation of equipment transferred from Panama Canal.....	\$329,426.68
Sundry accounts.....	119,970.33
	\$209,456.35
Total.....	66,690,180.42

Statement of expenditures, March 12, 1914, to June 30, 1928

Preliminary field survey in Alaska, comparison of routes and preparation of report before beginning of construction and additional location surveys.....	\$677, 196. 42
Purchase of Alaska Northern Railway.....	1, 140, 658. 48
Construction of line (Seaward to Fairbanks):	
Mile 0 to 12, inclusive, section 1.....	739, 996. 59
Mile 13 to 30, inclusive, section 2.....	446, 344. 38
Mile 31 to 45, inclusive, section 3.....	466, 239. 57
Mile 46 to 70.7, section 4.....	2, 768, 414. 88
Mile 70.7 to 79.3, section 5.....	1, 347, 441. 73
Mile 79.3 to 114.3, section 6.....	3, 995, 105. 92
Mile 114.3 to 227, section 7.....	6, 228, 610. 04
Matanuska branch, section 8.....	2, 752, 568. 07
Mile 228 to 264.1, section 9.....	2, 989, 938. 65
Mile 264.1 to 290, section 10.....	4, 513, 511. 32
Mile 290 to 315, section 11.....	1, 719, 693. 35
Mile 315 to 334.6, section 12.....	1, 639, 533. 99
Mile 334.6 to 347.3, section 13.....	1, 219, 328. 08
Mile 347.3 to 358.2, section 14.....	2, 547, 930. 63
Mile 358.2 to 411.7, section 15.....	4, 831, 285. 48
Tanana River Bridge.....	1, 060, 292. 29
Mile 412.3 to 467.7, section 16.....	2, 764, 682. 99
Chatanika branch, section 17.....	405, 042. 93
Plant at terminals, consisting of yard tracks, office building, storehouses, quarters for employees, mess houses, hospital, heating and lighting plant, freight handling machinery, etc.....	2, 466, 870. 31
Wharves and docks.....	623, 183. 86
Machine shops, engine houses, etc. (permanent).....	693, 916. 72
Marine equipment, boats, barges, etc.....	124, 215. 67
Construction equipment.....	1, 032, 513. 78
Shop and plant machinery.....	384, 778. 81
Rolling equipment.....	2, 271, 562. 17
Material and supplies on hand and in transit.....	1, 222, 490. 56
Anchorage town site.....	145, 998. 15
Nenana town site.....	42, 446. 18
Seward town site.....	13, 381. 41
Matanuska town site.....	9, 072. 32
Wasilla town site.....	1, 486. 11
Coal mines.....	402, 119. 42
Sawmills.....	45, 560. 29
Coal washery—Sutton.....	345, 734. 65
Investment in road and equipment to June 30, 1928.....	54, 079, 146. 20
Profit and loss (expenses of operation in excess of revenues to June 30, 1927).....	10, 425, 708. 83
Profit and loss (expenses of operation in excess of revenues July 1, 1927, to June 30, 1928).....	\$840, 890. 93
Uncollectible railway revenues.....	1. 61
Loss, nonoperating income accounts.....	1, 909. 08
	842, 801. 62
Less: Credit to expenses of operation on account of transportation of construction material.....	43, 705. 76
Deficit of operating and income accounts for the year ended June 30, 1928.....	799, 095. 86
Deposits in Treasury, miscellaneous receipts.....	\$8, 927. 58
Net investment of the United States to June 30, 1928.....	65, 312, 878. 47
Balance unexpended to June 30, 1928.....	1, 377, 301. 95

OPERATING REVENUES AND EXPENSES OF THE ALASKA RAILROAD

Comparative statement

	Fiscal years 1916-1925	Fiscal year 1926	Fiscal year 1927	Fiscal year 1928	Estimate, fiscal year 1929	Estimate, fiscal year 1930
Revenues:						
Rail line	\$4,470,294.45	\$994,354.60	\$1,260,213.78	\$1,354,939.44	\$1,285,000.00	\$1,350,000.00
River boats	133,446.59	73,157.27	73,469.10	96,795.20	100,000.00	100,000.00
Total revenues.....	4,603,741.04	1,067,511.87	1,333,682.88	1,451,734.64	1,385,000.00	1,450,000.00
Expenses:						
Rail line	14,960,645.60	2,130,488.45	2,132,813.82	2,202,329.88	2,195,000.00	2,140,000.00
River boats	220,200.98	106,225.46	101,043.73	90,295.69	90,000.00	110,000.00
Total expenses.....	15,180,846.58	2,236,713.91	2,233,857.55	2,292,625.57	2,285,000.00	2,250,000.00
	Fiscal years 1923-1925					
Operating deficit	\$5,011,830.90	1,169,202.04	900,174.67	840,890.93	900,000.00	800,000.00
Appropriations.....	3,947,400.00	1,200,000.00	1,200,000.00	1,000,000.00	900,000.00	800,000.00
Deficiency.....	1,064,430.90					
Surplus.....		30,797.96	299,825.33	159,109.07		

Comparative statement of operating revenues of the Alaska Railroad

RAIL LINE

	Fiscal years 1916-1925	Fiscal year 1926	Fiscal year 1927	Fiscal year 1928	Estimate, fiscal year 1929	Estimate, fiscal year 1930
Freight.....	\$1,792,405.17	\$566,810.95	\$811,496.53	\$875,298.06	\$800,000.00	\$850,000.00
Passenger	932,391.23	202,834.26	207,147.92	221,367.77	225,000.00	230,000.00
Mail	271,712.28	34,087.12	33,621.26	32,462.78	32,000.00	32,500.00
Express	18,139.94	5,240.22	6,557.04	8,156.99	9,000.00	10,000.00
Dining and buffet cars.....	25,850.90					
Hotel and restaurants.....	71,718.37	40,655.25	43,038.30	44,115.77	45,500.00	50,000.00
Telegraph and telephone.....	213,274.75	25,067.54	26,197.61	26,465.39	26,500.00	26,500.00
Power.....	420,719.63	64,092.19	64,256.18	66,026.17	66,000.00	66,000.00
Other revenue.....	724,082.18	55,567.07	67,898.94	81,046.51	81,000.00	85,000.00
Total revenues.....	4,470,294.45	994,354.60	1,260,213.78	1,354,939.44	1,285,000.00	1,350,000.00

RIVER BOATS

	Fiscal years 1924-25	Fiscal year 1926	Fiscal year 1927	Fiscal year 1928	Estimate, fiscal year 1929	Estimate, fiscal year 1930
Freight.....	\$41,314.33	\$25,827.56	\$29,817.28	\$52,645.48	\$55,000.00	\$55,000.00
Passenger	33,519.45	17,643.05	17,451.35	18,678.50	19,500.00	19,500.00
Excess baggage.....	486.80	204.06	187.90	274.45	300.00	300.00
Mail	54,353.34	28,955.53	23,843.90	25,020.53	25,000.00	25,000.00
Express	799.92	198.57	51.64	77.24	100.00	100.00
Other.....	2,972.75	328.50	2,117.03	99.00	100.00	100.00
Total revenues.....	133,446.59	73,157.27	73,469.10	96,795.20	100,000.00	100,000.00

Comparative statement of operating expenses of the Alaska Railroad

RAIL LINE

	Fiscal years 1916-1925	Fiscal year 1926	Fiscal year 1927	Fiscal year 1928	Estimate, fiscal year 1929	Estimate, fiscal year 1930
Maintenance of way and structures.....	\$6,900,917.55	\$1,154,930.26	\$1,089,668.20	\$1,153,370.92	\$1,150,000.00	\$1,090,000.00
Maintenance of equip- ment.....	2,292,308.41	251,024.54	295,233.55	274,105.77	285,000.00	275,000.00
Traffic.....	45,776.42	26,589.05	28,231.92	22,201.52	22,000.00	25,000.00
Transportation:						
Water line.....	36,717.33					
Rail line.....	4,396,821.43	479,778.74	482,487.04	509,215.29	500,000.00	510,000.00
Miscellaneous opera- tions.....	825,309.71	111,361.33	131,215.29	143,825.77	138,000.00	140,000.00
General.....	462,794.75	106,804.53	105,977.82	99,610.61	100,000.00	100,000.00
Total expenditures.....	14,960,645.60	2,130,488.45	2,132,813.82	2,202,329.88	2,195,000.00	2,140,000.00

RIVER BOATS

	Fiscal years 1924-25	Fiscal year 1926	Fiscal year 1927	Fiscal year 1928	Estimate, fiscal year 1929	Estimate, fiscal year 1930
Repairs, floating equipment...	\$31,626.83	\$19,658.93	\$24,005.55	\$21,942.34	\$22,000.00	\$35,000.00
Operating of vessels.....	172,985.42	77,648.68	68,072.80	60,584.22	60,500.00	65,000.00
Operation of terminals.....	14,231.00	8,010.49	9,725.49	7,382.30	7,500.00	9,500.00
Incidentals.....	1,357.73	907.36	1,760.11	386.83		500.00
Total expenses.....	220,200.98	106,225.46	101,043.73	90,295.69	90,000.00	110,000.00

¹ Contra.

OFFICE OF THE SOLICITOR

Cases received and disposed of in the office of the solicitor during the fiscal year ended June 30, 1928

	Public land matters		Pension mat- ters		Retirement matters		Miscel- laneous ¹	Total
	On ap- peal	On re- hearing	On ap- peal	On re- hearing	On ap- peal	On re- hearing		
Pending July 1, 1927.....	523	9	263	3	14	0	102	914
Received during the year.....	1,186	190	1,017	32	101	26	44,653	47,205
Total.....	1,709	199	1,280	35	115	26	44,755	48,119
Disposed of.....	1,123	184	1,159	34	108	25	44,695	47,328
Pending July 1, 1928.....	586	15	121	1	7	1	60	791

¹ "Miscellaneous" includes such matters as solicitor's opinions, contracts, proposed decisions submitted by various bureaus, matters arising under the mineral leasing law (permits to prospect, leases, assignments, etc.), disbarment matters, cases submitted to the board of equitable adjudication, etc.

GENERAL LAND OFFICE

GENERAL LAND OFFICE TABLE 1.—*Statistics relating to the disposition of the public domain*

AREA OF STATES AND TERRITORIES

[Based upon careful joint calculations made in the General Land Office, the Geological Survey, and the Bureau of the Census]

State or Territory	Land surface		Water surface		Total areas	
	<i>Sq. miles</i>	<i>Acres</i>	<i>Sq. miles</i>	<i>Acres</i>	<i>Sq. miles</i>	<i>Acres</i>
Alabama.....	51,279	32,818,560	719	460,160	51,998	33,278,720
Arizona.....	113,810	72,838,400	146	93,440	113,956	72,931,840
Arkansas.....	52,525	33,616,000	810	518,400	53,335	34,134,400
California.....	155,652	99,617,280	2,645	1,692,800	158,297	101,310,080
Colorado.....	103,658	66,341,120	290	185,600	103,948	66,526,720
Connecticut.....	4,820	3,084,800	145	92,800	4,965	3,177,600
Delaware.....	1,965	1,257,600	405	259,200	2,370	1,516,800
District of Columbia.....	62	39,680	8	5,120	70	44,800
Florida.....	54,861	35,111,040	3,805	2,435,200	58,666	37,546,240
Georgia.....	58,725	37,584,000	540	345,600	59,265	37,929,600
Idaho.....	83,534	53,346,560	534	341,760	83,888	53,688,320
Illinois.....	56,043	35,867,520	622	398,080	56,665	36,265,600
Indiana.....	36,045	23,068,800	309	197,760	36,354	23,266,560
Iowa.....	55,586	35,575,040	561	359,040	56,147	35,934,080
Kansas.....	81,774	52,335,360	384	245,760	82,158	52,581,120
Kentucky.....	40,181	25,715,840	417	266,880	40,598	25,982,720
Louisiana.....	45,009	29,061,760	3,097	1,982,080	48,506	31,043,840
Maine.....	29,895	19,132,800	3,145	2,012,800	33,040	21,145,600
Maryland.....	9,941	6,362,240	2,386	1,527,040	12,327	7,889,280
Massachusetts.....	8,039	5,144,960	227	145,280	8,266	5,290,240
Michigan.....	57,480	36,787,200	500	320,000	57,980	37,107,200
Minnesota.....	80,858	51,749,120	3,824	2,447,360	84,682	54,196,480
Mississippi.....	46,362	29,671,680	503	321,920	46,865	29,993,600
Missouri.....	68,727	43,985,280	693	443,520	69,420	44,428,800
Montana.....	146,201	93,568,640	796	509,440	146,997	94,078,080
Nebraska.....	76,808	49,157,120	712	455,680	77,520	49,612,800
Nevada.....	109,821	70,245,440	869	556,160	110,690	70,841,600
New Hampshire.....	9,031	5,779,840	310	198,400	9,341	5,978,240
New Jersey.....	7,514	4,808,960	710	454,400	8,224	5,263,360
New Mexico.....	122,503	78,401,920	131	83,840	122,634	78,485,760
New York.....	47,654	30,498,560	1,550	992,000	49,204	31,490,560
North Carolina.....	48,740	31,193,600	3,686	2,359,040	52,426	33,552,640
North Dakota.....	70,183	44,917,120	654	418,560	70,837	45,335,680
Ohio.....	40,740	26,073,600	300	192,000	41,040	26,265,600
Oklahoma.....	69,414	44,424,960	643	411,520	70,057	44,836,480
Oregon.....	95,607	61,188,480	1,092	698,880	96,699	61,887,360
Pennsylvania.....	44,832	28,692,480	294	188,160	45,126	28,880,640
Rhode Island.....	1,067	682,880	181	115,840	1,248	798,720
South Carolina.....	30,495	19,516,800	494	316,160	30,989	19,832,960
South Dakota.....	76,868	49,195,520	747	478,080	77,615	49,673,600
Tennessee.....	41,687	26,679,680	335	214,400	42,022	26,894,080
Texas.....	262,398	167,934,720	3,498	2,238,720	265,896	170,173,440
Utah.....	82,184	52,597,760	2,806	1,795,840	84,990	54,393,600
Vermont.....	9,124	5,839,360	440	281,600	9,564	6,120,960
Virginia.....	40,262	25,767,680	2,365	1,513,600	42,627	27,281,280
Washington.....	66,836	42,775,040	2,291	1,466,240	69,127	44,241,280
West Virginia.....	24,022	15,374,080	148	94,720	24,170	15,468,800
Wisconsin.....	55,256	35,363,840	810	518,400	56,066	35,882,240
Wyoming.....	97,594	62,460,160	320	204,800	97,914	62,664,960
Alaska.....	2,973,892	1,903,290,880	52,897	33,854,080	3,026,789	1,937,144,960
Guam.....					590,884	378,165,760
Hawaii.....					206	131,840
Canal Zone.....					6,406	4,099,840
Philippine Islands.....					549	351,360
Porto Rico ¹					114,400	73,216,000
American Samoa.....					3,435	2,198,400
Virgin Islands.....					75	48,000
					133	85,120
Total.....					3,742,877	2,395,441,280

¹ Including adjacent islands.

Owing to their location adjoining the Great Lakes, the States enumerated below contain approximately an additional number of square miles as follows: Illinois, 1,674 square miles of Lake Michigan; Indiana, 230 square miles of Lake Michigan; Michigan, 16,653 square miles of Lake Superior, 12,922 square miles of Lake Michigan, 9,925 square miles of Lake Huron, and 460 square miles of Lakes St. Clair and Erie; Minnesota, 2,514 square miles of Lake Superior; New York, 3,140 square miles of Lakes Ontario and Erie; Ohio, 3,443 square miles of Lake Erie; Pennsylvania, 891 square miles of Lake Erie; Wisconsin, 2,378 square miles of Lake Superior and 7,500 square miles of Lake Michigan.

In addition to the water areas noted above, California claims jurisdiction over all Pacific waters lying within 3 English miles of her coast; Oregon claims jurisdiction over a similar strip of the Pacific Ocean 1 marine league in width between latitude 42° north and the mouth of the Columbia River, and Texas claims jurisdiction over a strip of Gulf waters 3 leagues in width adjacent to her coast and between the Rio Grande and the Sabine Rivers.

GENERAL LAND OFFICE TABLE 2.—*United States district land offices (29)*

Locations	Established	Opened	Locations	Established	Opened
Alaska:			Nebraska: Alliance..	Apr. 16, 1890	July 1, 1890
Anchorage.....	May 17, 1923	July 1, 1923	Nevada: Carson City	July 2, 1862	Mar. 1, 1864
Fairbanks.....	May 14, 1907	July 1, 1907	New Mexico:		
Nome.....	May 14, 1907	July 1, 1907	Las Cruces.....	Mar. 10, 1883	May 1, 1883
Arizona: Phoenix.....	July 25, 1905	Oct. 2, 1905	Santa Fe.....	May 24, 1858	Nov. 24, 1858
Arkansas: Little			North Dakota: Bis-		
Rock.....	Feb. 17, 1818	Sept. 1, 1821	marek.....	Apr. 24, 1874	Oct. 12, 1874
California:			Oregon:		
Los Angeles.....	June 12, 1869	Sept. 22, 1869	Lakeview.....	June 6, 1877	Aug. 6, 1877
Sacramento.....	July 26, 1866	Nov. 12, 1867	Roseburg.....	Sept. 15, 1859	Jan. 3, 1860
Colorado:			The Dalles.....	Jan. 11, 1875	June 1, 1875
Denver.....	June 4, 1864	Aug. 15, 1864	South Dakota: Pierre	Feb. 10, 1890	May 12, 1890
Pueblo.....	May 27, 1870	Jan. 16, 1871	Utah: Salt Lake City	July 16, 1868	Nov. 1, 1868
Florida: Gainesville.	June 8, 1872	Apr. 30, 1873	Washington: Spo-		
Idaho:			kane.....	June 23, 1883	Oct. 1, 1883
Blackfoot.....	Sept 3, 1886	Nov. 16, 1886	Wyoming:		
Coeur d'Alene.....	July 14, 1884	Dec. 21, 1885	Buffalo.....	Mar. 3, 1887	May 1, 1888
Minnesota: Cass			Cheyenne.....	Feb. 5, 1870	Aug. 10, 1870
Lake.....	Apr. 1, 1903	July 1, 1903	Evanston.....	Aug. 9, 1876	Aug. 13, 1877
Montana:					
Billings.....	Feb. 5, 1906	July 2, 1906			
Great Falls.....	May 8, 1902	Aug. 1, 1902			

NOTE.—Vacant public lands in States which have no district land offices are subject to entry and location at the General Land Office, Washington, D. C.

GENERAL LAND OFFICE TABLE 3.—*List of public survey offices*

Locations	Established	Locations	Established
Alaska: Juneau.....	May 17, 1884	Nevada: Reno.....	July 4, 1866
Arizona: Phoenix.....	Feb. 24, 1863	New Mexico: Santa Fe.....	Mar. 2, 1867
California: San Francisco.....	Mar. 3, 1851	Oregon: Portland.....	Sept. 27, 1850
Colorado: Denver.....	Feb. 28, 1861	Utah: Salt Lake City.....	July 16, 1868
Idaho: Boise.....	June 29, 1866	Washington: Olympia.....	July 17, 1854
Montana: Helena.....	July 2, 1864	Wyoming: Cheyenne.....	Feb. 5, 1870

Inspection division headquarters of inspectors of General Land Office

Inspection division:		Inspection division—Continued.	
Portland.....	Portland, Oreg.	Denver.....	Denver, Colo.
San Francisco.....	San Francisco, Calif.	Salt Lake City.....	Salt Lake City, Utah.
Alaskan.....	Anchorage, Alaska.	Santa Fe.....	Santa Fe, N. Mex.
Helena.....	Helena, Mont.		

Number of employees of the General Land Office, June 30, 1928

In General Land Office, Washington, D. C.....	330
In the district land offices.....	97
In the inspection service.....	104
In the surveying service.....	165
In the logging service.....	2
Total.....	698

GENERAL LAND OFFICE TABLE 4.—*Final homestead entries from passage of homestead act to June 30, 1928. (Commutated homesteads are not included)*

Fiscal year ended June 30—	Number	Acres	Fiscal year ended June 30—	Number	Acres
1868.....	2,772	355,086.04	1900.....	25,286	3,477,842.71
1869.....	3,965	504,301.97	1901.....	37,568	5,241,120.76
1870.....	4,041	519,727.84	1902.....	31,627	4,342,747.70
1871.....	5,087	629,162.25	1903.....	26,373	3,576,964.14
1872.....	5,917	707,409.83	1904.....	23,932	3,232,716.75
1873.....	10,311	1,224,890.93	1905.....	24,621	3,419,387.15
1874.....	14,129	1,585,781.56	1906.....	25,546	3,526,748.58
1875.....	18,293	2,068,537.74	1907.....	26,485	3,740,567.71
1876.....	22,530	2,590,552.81	1908.....	29,636	4,242,710.59
1877.....	19,900	2,407,828.19	1909.....	25,510	3,699,466.79
1878.....	22,460	2,662,980.82	1910.....	23,253	3,795,862.89
1879.....	17,391	2,070,842.39	1911.....	25,908	4,620,197.12
1880.....	15,441	1,938,234.89	1912.....	24,326	4,306,068.62
1881.....	15,077	1,928,204.76	1913.....	53,252	10,009,285.16
1882.....	17,174	2,219,453.80	1914.....	48,724	9,291,121.46
1883.....	18,998	2,504,414.51	1915.....	37,343	7,180,981.62
1884.....	21,843	2,945,574.72	1916.....	37,958	7,278,280.60
1885.....	22,066	3,032,679.11	1917.....	43,727	8,497,389.68
1886.....	19,356	2,663,531.83	1918.....	41,319	8,236,438.18
1887.....	19,866	2,749,037.48	1919.....	32,623	6,524,759.68
1888.....	22,413	3,175,400.64	1920.....	39,774	8,372,695.79
1889.....	25,549	3,681,708.80	1921.....	33,889	7,726,740.44
1890.....	28,080	4,060,592.77	1922.....	30,919	7,307,034.42
1891.....	27,686	3,954,587.77	1923.....	22,420	5,594,258.69
1892.....	22,822	3,259,897.07	1924.....	18,046	4,791,436.44
1893.....	24,204	3,477,231.63	1925.....	14,675	4,048,910.56
1894.....	20,544	2,929,947.41	1926.....	12,244	3,451,105.51
1895.....	20,922	2,980,809.30	1927.....	9,315	2,583,627.48
1896.....	20,099	2,790,242.55	1928.....	6,667	1,815,549.31
1897.....	20,115	2,778,404.20			
1898.....	22,281	3,095,017.75	Total.....	1,407,110	230,558,230.23
1899.....	22,812	3,134,140.44			

GENERAL LAND OFFICE TABLE 5.—*Timber and stone entries from passage of act June 3, 1878, to June 30, 1928*

States	Entries	Acres	Amount
Alabama.....	647	43,734.95	\$147,169.55
Arizona.....	26	2,942.80	9,311.07
Arkansas.....	2,968	359,702.40	846,318.38
California.....	21,024	2,895,480.57	7,400,925.04
Colorado.....	3,270	399,628.65	1,042,324.19
Florida.....	993	108,956.12	314,447.01
Idaho.....	7,590	1,012,947.17	2,687,173.00
Iowa.....	3	119.36	298.46
Louisiana.....	1,723	150,277.20	396,292.39
Michigan.....	1,850	149,666.91	377,356.84
Minnesota.....	12,711	1,408,612.55	3,553,285.16
Mississippi.....	307	19,818.16	73,476.20
Montana.....	5,201	664,004.57	1,728,965.52
Nebraska.....	2	97.33	268.00
Nevada.....	52	6,502.14	16,205.74
North Dakota.....	81	8,646.31	22,005.78
Oklahoma.....	1	40.00	100.00
Oregon.....	26,932	3,812,413.27	9,792,961.29
South Dakota.....	591	63,908.73	165,187.80
Utah.....	31	3,195.85	8,018.08
Washington.....	16,389	2,167,688.67	5,523,190.16
Wisconsin.....	1,136	80,362.04	202,755.64
Wyoming.....	3,930	452,589.11	1,129,159.19
General Land Office.....	68	3,287.08	14,499.91
Total.....	107,526	13,814,621.94	35,451,694.40

GENERAL LAND OFFICE TABLE 6.—*Coal-land entries from passage of act March 3, 1873, to June 30, 1928*

State or Territory	Entries	Acres	Amount
Alabama.....	2	239. 40	\$2,394. 00
Arizona.....	43	6,693. 35	74,997. 00
California.....	38	5,535. 06	81,531. 30
Colorado.....	1,059	158,113. 38	2,385,693. 75
Colorado ¹	447	58,495. 65	891,219. 55
Dakota Territory.....	8	583. 57	5,835. 70
Idaho.....	14	3,277. 41	37,911. 80
Idaho.....	506	64,758. 47	1,219,419. 39
Montana.....	14	1,661. 01	20,442. 20
Nevada.....	254	26,613. 38	441,323. 75
New Mexico.....	164	9,543. 59	150,880. 20
North Dakota.....	69	10,571. 96	125,552. 90
Oregon.....	56	3,623. 64	39,764. 80
South Dakota.....	524	75,828. 02	2,531,661. 95
Utah.....	406	64,893. 51	1,044,525. 20
Washington.....	811	113,923. 87	2,867,689. 36
Wyoming.....	1	7. 95	159. 00
General Land Office.....			
Total.....	4,416	604,363. 22	11,921,001. 85

¹ Within the Ute Reservation.GENERAL LAND OFFICE TABLE 7.—*Desert-land entries from passage of act March 3, 1877, to June 30, 1928*

State or Territory	Entries		Acres		Amount		
	Original	Final	Original	Final	Original	Final	Total
Arizona.....	9,918	1,480	2,567,401. 50	347,350. 50	\$644,408. 44	\$378,734. 02	\$1,023,142. 46
California.....	23,866	4,925	5,159,824. 36	879,669. 23	1,306,068. 14	901,704. 37	2,207,772. 51
Colorado.....	17,456	4,074	3,224,222. 92	706,382. 05	906,593. 72	700,087. 26	1,606,680. 98
Dakota Territory.....	35	1	20,021. 00	300. 00	5,005. 25	300. 00	5,305. 25
Idaho.....	18,321	5,305	3,109,650. 81	1,025,402. 95	778,782. 57	977,820. 16	1,756,602. 73
Montana.....	32,051	14,671	5,981,054. 18	2,762,171. 08	1,501,814. 66	2,757,375. 12	4,259,189. 78
Nevada.....	3,048	820	640,444. 04	158,603. 09	150,519. 37	158,270. 60	308,789. 97
New Mexico.....	11,253	1,596	2,158,516. 49	232,374. 68	541,770. 47	330,844. 52	872,614. 99
North Dakota.....	517	117	85,278. 51	20,094. 18	21,321. 09	20,118. 92	41,440. 01
Oregon.....	6,608	1,918	1,111,758. 46	297,395. 30	277,516. 19	293,723. 74	571,239. 93
South Dakota.....	4,070	613	609,290. 58	101,761. 12	151,917. 37	99,448. 85	251,366. 22
Utah.....	8,549	2,942	1,497,732. 90	451,152. 76	381,252. 11	456,348. 35	837,600. 46
Washington.....	6,077	670	997,954. 13	70,864. 94	260,408. 98	83,141. 55	343,550. 53
Wyoming.....	17,198	7,306	5,532,796. 03	1,509,214. 42	940,120. 76	1,513,254. 04	2,453,374. 80
Total.....	158,967	46,438	32,695,945. 91	8,562,736. 30	7,867,499. 12	8,671,171. 50	16,538,670. 62

GENERAL LAND OFFICE TABLE 8.—*Lands certified or patented on account of railroad and wagon-road grants during fiscal year ended June 30, 1928*

Grant	State	Area
CORPORATIONS		
Atlantic & Pacific, now Santa Fe Pacific Railroad Co.....	Arizona.....	<i>Acres</i> 4,197. 14
Do.....	New Mexico.....	8,465. 71
Central Pacific Railroad Co.....	California.....	3,512. 20
Do.....	Nevada.....	44,695. 82
Central Pacific Railroad Co. (California & Oregon branch).....	California.....	9,434. 82
Oregon & California Railroad Co.....	Oregon.....	40. 00
Southern Pacific (main line) Railroad Co.....	California.....	8,351. 77
Southern Pacific (branch line) Railroad Co.....	do.....	163. 94
Total.....		78,861. 40
STATE		
Selma, Rome & Dalton Railroad Co.....	Alabama.....	115. 45
Memphis & Little Rock Railroad Co.....	Arkansas.....	40. 00
St. Louis, Iron Mountain & Southern Railroad Co.....	do.....	40. 00
Florida Central & Peninsular Railroad Co.....	Florida.....	119. 72
Vicksburg, Shreveport & Pacific Railroad Co.....	Louisiana.....	818. 95
St. Paul, Minneapolis & Manitoba Railroad Co.....	Minnesota.....	4,378. 64
Total.....		5,512. 76
WAGON ROADS		
Oregon Central Military Co. (now California & Oregon Land Co.).....	Oregon.....	1,355. 63
Grand total.....		85,729. 79
Total certified or patented during year.....		85,729. 79
Total canceled during year.....		44,840. 00
Total.....		130,569. 79
Total received during year.....		117,672. 77

Lands patented or certified under concessions by act of Congress to States and corporations for railroad and military wagon-road purposes from the year 1850 to June 30, 1928

STATE GRANTS		Acres
Illinois: Illinois Central.....		2,595,133. 00
Mississippi:		
Mobile & Ohio River.....		737,130. 29
Vicksburg & Meridian.....		199,101. 51
Gulf & Ship Island.....		139,113. 32
Total.....		1,075,345. 12
Alabama:		
Mobile & Ohio.....		¹ 419,528. 44
Alabama & Florida.....		399,022. 84
Selma, Rome & Dalton.....		458,671. 27
Coosa & Tennessee.....		67,784. 96
Mobile & Girard.....		² 302,181. 16
Alabama & Chattanooga.....		654,170. 38
South & North Alabama.....		445,478. 47
Total.....		2,746,837. 52

¹ In the adjustment of this grant the road was treated as an entirety and without reference to the State line; hence Alabama has had approved to her more and Mississippi less than they would appear to be entitled to in proportion to the length of the road in the respective States.

² This grant was adjusted Apr. 24, 1893, and 302,181.16 acres were allotted to the company. The balance of the previously certified lands were ordered restored to entry under the forfeiture act of Sept. 29, 1890.

Lands patented or certified under concessions by act of Congress to States and corporations for railroad and military wagon-road purposes from the year 1850 to June 30, 1928—Continued

STATE GRANTS—continued		Acres
Florida:		
Florida Central & Peninsular	-----	742, 467. 51
Florida & Alabama	-----	166, 691. 08
Pensacola & Georgia	-----	1, 279, 236. 70
Florida, Atlantic & Gulf Central	-----	29, 384. 18
Total	-----	2, 217, 879. 47
Louisiana:		
Vicksburg, Shreveport & Pacific	-----	372, 998. 27
New Orleans, Opelousas & Great Western	-----	(³)
Arkansas:		
St. Louis, Iron Mountain & Southern	-----	1, 325, 622. 05
Little Rock & Fort Smith	-----	1, 052, 082. 51
Memphis & Little Rock	-----	184, 697. 33
Total	-----	2, 562, 401. 89
Missouri:		
Southwest branch of the Pacific road	-----	1, 161, 284. 51
Hannibal & St. Joseph	-----	611, 323. 35
St. Louis, Iron Mountain & Southern	-----	65, 360. 31
Total	-----	1, 837, 968. 17
Iowa:		
Burlington & Missouri River	-----	389, 990. 11
Chicago, Rock Island & Pacific	-----	⁴ 483, 214. 36
Cedar Rapids & Missouri River	-----	161, 532. 81
		⁴ 922, 824. 85
Dubuque & Sioux City	-----	244, 022. 96
Iowa Falls & Sioux City	-----	⁴ 556, 406. 74
Des Moines Valley (river-improvement grant)	-----	683, 057. 34
Chicago, Milwaukee & St. Paul, formerly McGregor & Missouri River	-----	840, 171. 36
Sioux City & St. Paul	-----	326, 216. 10
	-----	322, 412. 81
Total	-----	4, 929, 849. 44
Michigan:		
Port Huron & Lake Michigan	-----	37, 467. 44
Jackson, Lansing & Saginaw	-----	743, 827. 58
Grand Rapids & Indiana	-----	852, 521. 10
Flint & Pere Marquette	-----	⁵ 513, 129. 68
Marquette, Houghton & Ontonagon	-----	305, 929. 59
Ontonagon & Brule River	-----	34, 227. 08
Bay de Noquet & Marquette	-----	128, 301. 05
Chicago & North Western	-----	518, 185. 36
Total	-----	3, 133, 588. 88

³ Certified lands footing 719,189.79 acres were reconveyed to the United States by the Governor of Louisiana, Feb. 24, 1888, the grant having been forfeited by the act of July 14, 1870 (16 Stat. 277).

⁴ Includes 35,685.49 acres of the Chicago, Rock Island & Pacific Railroad; 109,756.85 acres of the Cedar Rapids & Missouri Railroad; and 77,535.32 acres of the Dubuque & Sioux City Railroad, situated in the old Des Moines River grant of Aug. 8, 1846, which should be deducted from the foregoing amount. (Walcott v. Des Moines Co., 5 Wall. 631.)

⁵ Excess of 131,481.71 acres originally certified under this grant reconveyed by State or entered under act of Mar. 3, 1887, by Michigan Land & Iron Co. (Ltd.), grant having been forfeited in part by act of Mar. 2, 1889 (25 Stat. 1008).

Lands patented or certified under concessions by act of Congress to States and corporations for railroad and military wagon-road purposes from the year 1850 to June 30, 1928—Continued

STATE GRANTS—continued

Wisconsin:

	Acres
Chicago, St. Paul, Minneapolis & Omaha (formerly West Wisconsin).....	814, 671. 04
Wisconsin Railroad Farm Mortgage Land Co.....	163, 159. 65
Chicago, St. Paul, Minneapolis & Omaha (formerly St. Croix & Lake Superior).....	816, 487. 76
Branch to Bayfield.....	471, 721. 14
Chicago & North Western.....	546, 446. 20
Wisconsin Central.....	839, 027. 69
Total.....	3, 651, 513. 48

Minnesota:

St. Paul, Minneapolis & Manitoba (formerly first division, St. Paul & Pacific).....	} 3, 272, 148. 81
Western Railroad (succeeded by St. Paul & Northern Pacific Railroad Co.).....	
St. Paul, Minneapolis & Manitoba (formerly St. Vincent extension of the St. Paul & Pacific).....	}
Minnesota Central.....	
Winona & St. Peter.....	1, 680, 974. 92
St. Paul & Sioux City.....	1, 126, 618. 55
St. Paul & Duluth.....	861, 091. 73
Southern Minnesota, from a point on the Mississippi River to Houston.....	} 546, 745. 44
Southern Minnesota extension (now Chicago, Milwaukee & St. Paul).....	
Hastings & Dakota.....	377, 977. 99
Total.....	8, 045, 291. 73

Minnesota, North Dakota, Montana, and Washington: St. Paul, Minneapolis & Manitoba, now Great Northern (main and branch), a special act (Aug. 5, 1892, 27 Stat. L., 390), to provide for indemnity for lands relinquished by the company.....

(7)

Kansas:

Leavenworth, Lawrence & Galveston.....	⁸ 249, 446. 13
Missouri, Kansas & Texas.....	⁹ 976, 593. 22
Atchison, Topeka & Santa Fe.....	2, 944, 788. 14
St. Joseph & Denver City.....	463, 369. 12
Total.....	4, 634, 196. 61
Grand total.....	37, 802, 903. 58

⁶ Declared to be one grant (see 32 L. D. 21).

⁷ See Minnesota for original grants.

⁸ Includes 186,936.72 acres of the "Osage ceded reservation," which are to be deducted from the above amount under the decision of the Supreme Court in the case of the Leavenworth, Lawrence & Galveston Railroad v. The United States (92 U. S. 733).

⁹ Includes 270,970.78 acres in the "Osage ceded reservation," which are to be deducted under the decision cited in note 8.

Lands patented or certified under concessions by act of Congress to States and corporations for railroad and military wagon-road purposes from the year 1850 to June 30, 1928—Continued

CORPORATION GRANTS		Acres
Central Pacific.....	7, 336, 066. 08	
Central Pacific (Western Pacific).....	461, 498. 29	
Central Pacific (California & Oregon).....	3, 219, 184. 06	
Union Pacific.....	11, 935, 281. 46	
Union Pacific (Central Branch).....	223, 139. 91	
Union Pacific (Kansas Division).....	6, 176, 383. 76	
Union Pacific (Denver Pacific).....	821, 324. 15	
Santa Fe Pacific (Atlantic & Pacific).....	11, 288, 132. 99	
Burlington & Missouri River in Nebraska.....	2, 374, 090. 77	
Sioux City & Pacific (Missouri Valley Land Co.).....	42, 610. 95	
Northern Pacific.....	39, 030, 499. 19	
Oregon Central.....	128, 618. 13	
Oregon & California.....	2, 777, 631. 96	
New Orleans Pacific.....	1, 001, 943. 40	
Southern Pacific (main line).....	4, 634, 230. 45	
Southern Pacific (branch line).....	2, 225, 753. 98	
Grand total.....	93, 676, 386. 53	

WAGON ROADS		
From Lake Erie to Connecticut Western Reserve.....	80, 773. 54	
From Lake Michigan to Ohio River.....	170, 580. 24	
From Fort Wilkins, Copper Harbor, Mich., to Green Bay, Wis....	302, 930. 96	
From Fort Wilkins, Copper Harbor, Mich., to Wisconsin State line.....	221, 013. 35	
Oregon Central Military Co. (now California & Oregon Land Co.).....	877, 944. 45	
Corvallis and Yaquina Bay.....	83, 716. 76	
Willamette Valley and Cascade Mountain.....	861, 511. 86	
Dalles Military Road.....	592, 907. 04	
Coos Bay Military Road.....	105, 240. 11	
Grand total.....	3, 296, 618. 31	

Land and scrip granted to States and Territories for Educational and other purposes, 1928

Alabama:		Acres
Tuskegee Normal and Industrial Institute.....	25, 000. 00	
Industrial School for Girls.....	25, 000. 00	
Seminary of learning.....	46, 080. 00	
Internal improvements, including river and shoals.....	500, 000. 00	
Agricultural college scrip.....	240, 000. 00	
Common schools, section 16.....	911, 627. 00	
Salt springs and contiguous lands.....	23, 040. 00	
Seat of government.....	1, 620. 00	
University.....	46, 080. 00	
Searcy Hospital for colored insane.....	181. 41	
Swamp.....	418, 713. 61	
Swamp-land indemnity.....	20, 920. 08	
Total.....	2, 258, 262. 10	
Alaska Territory:		
Common schools, sections 16 and 36, reserved (estimated).....	21, 009, 209. 00	
Agricultural college and school of mines, certain secs. 33, reserved (estimated).....	336, 000. 00	
Total.....	21, 345, 209. 00	

Land and scrip granted to States and Territories for Educational and other purposes, 1928—Continued

Arizona:	Acres
University.....	246, 080. 00
Public buildings.....	100, 000. 00
Penitentiaries.....	100, 000. 00
Insane Asylums.....	100, 000. 00
Deaf, dumb, and blind asylum.....	100, 000. 00
Miners' hospital.....	50, 000. 00
Normal schools.....	200, 000. 00
Charitable, penal, etc.....	100, 000. 00
Agricultural and mechanical colleges.....	150, 000. 00
School of mines.....	150, 000. 00
Military institutes.....	100, 000. 00
Payment of bonds issued to Maricopa, Pima, Yavapai and Coconino Counties.....	1, 000, 000. 00
Common schools, sections 2 and 32, 16 and 36.....	8, 093, 156. 00
Total.....	10, 489, 236. 00
Arkansas:	
Internal improvements.....	500, 000. 00
University.....	46, 080. 00
Public buildings.....	10, 600. 00
Agricultural college scrip.....	150, 000. 00
Common schools, section 16.....	933, 778. 00
Salt springs and contiguous lands.....	46, 080. 00
Swamp.....	7, 686, 455. 37
Total.....	9, 372, 993. 37
California:	
Internal improvements.....	500, 000. 00
University.....	46, 080. 00
Public buildings.....	6, 400. 00
Agricultural and mechanical colleges.....	150, 000. 00
Common schools, sections 16 and 36.....	5, 534, 293. 00
Swamp.....	2, 188, 547. 32
Total.....	8, 425, 320. 32
Colorado:	
Internal improvements.....	500, 000. 00
University.....	46, 080. 00
Public buildings.....	32, 000. 00
Penitentiaries.....	32, 000. 00
Agricultural college.....	90, 000. 00
Common schools, sections 16 and 36.....	3, 685, 618. 00
Salt springs and contiguous lands.....	46, 080. 00
State agricultural college.....	1, 600. 00
Biological station.....	160. 00
Total.....	4, 433, 538. 00
Connecticut: Agricultural college scrip.....	180, 000. 00
Delaware: Agricultural college scrip.....	90, 000. 00
Florida:	
Internal improvements.....	500, 000. 00
Seminaries of learning.....	92, 160. 00
Seat of government.....	5, 120. 00
Agricultural college scrip.....	90, 000. 00
Common schools, section 16.....	975, 307. 00
Swamp.....	20, 212, 039. 29
Swamp-land indemnity.....	94, 782. 80
Total.....	21, 969, 409. 09
Georgia: Agricultural college scrip.....	270, 000. 00

Land and scrip granted to States and Territories for Educational and other purposes, 1928—Continued

	Acres
Idaho:	
Lava hot springs.....	187. 30
University.....	46, 080. 00
University, Moscow.....	50, 000. 00
Agricultural college.....	90, 000. 00
Penitentiary.....	50, 000. 00
Public buildings.....	32, 000. 00
Insane asylum.....	50, 000. 00
Educational, charitable, etc.....	150, 000. 00
Normal schools.....	100, 000. 00
Scientific schools.....	100, 000. 00
Common schools, sections 16 and 36.....	2, 963, 698. 00
Total.....	3, 631, 965. 30
Illinois:	
Internal improvements, including canals.....	533, 368. 24
Seminary of learning.....	46, 080. 00
Seat of government.....	2, 560. 00
Agricultural college scrip.....	480, 000. 00
Common schools, section 16.....	996, 320. 00
Salt springs and contiguous lands.....	121, 029. 00
Swamp.....	1, 457, 559. 20
Swamp-land indemnity.....	2, 309. 07
Total.....	3, 639, 225. 51
Indiana:	
Internal improvements (canals and roads).....	1, 916, 804. 56
Seminary of learning.....	46, 080. 00
Seat of government.....	2, 560. 00
Agricultural college scrip.....	390, 000. 00
Common schools, section 16.....	668, 578. 00
Salt springs and contiguous lands.....	23, 040. 00
Swamp.....	1, 254, 310. 73
Swamp-land indemnity.....	4, 880. 20
Total.....	4, 306, 253. 49
Iowa:	
Internal improvements.....	500, 000. 00
University.....	46, 080. 00
Public buildings.....	3, 200. 00
Agricultural college.....	240, 000. 00
Common schools, section 16.....	988, 196. 00
Salt springs and contiguous lands.....	46, 080. 00
Swamp.....	874, 112. 63
Swamp-land indemnity.....	321, 976. 98
Total.....	3, 019, 645. 61
Kansas:	
Internal improvements.....	500, 000. 00
University.....	46, 080. 00
Public buildings.....	6, 400. 00
Agricultural college.....	90, 000. 00
Do.....	7, 682. 00
Common schools, sections 16 and 36.....	2, 907, 520. 00
Salt springs and contiguous lands.....	46, 080. 00
Game preserve.....	3, 021. 20
Total.....	3, 606, 783. 20

Land and scrip granted to States and Territories for Educational and other purposes, 1928—Continued

	Acres
Kentucky:	
Deaf and dumb asylum.....	22, 508. 65
Agricultural college scrip.....	330, 000. 00
Total.....	352, 508. 65
Louisiana:	
University and agricultural college.....	211. 56
Internal improvements.....	500, 000. 00
Seminary of learning.....	46, 080. 00
Agricultural college scrip.....	210, 000. 00
Common schools, section 16.....	807, 271. 00
Swamp.....	9, 423, 525. 18
Swamp-land indemnity.....	32, 630. 97
Total.....	11, 019, 718. 71
Maine: Agricultural college scrip.....	210, 000. 00
Maryland: Agricultural college scrip.....	210, 000. 00
Massachusetts: Agricultural college scrip.....	360, 000. 00
Michigan:	
Internal improvements.....	500, 000. 00
University.....	46, 080. 00
Public buildings.....	3, 200. 00
Agricultural college.....	240, 000. 00
Common schools, section 16.....	1, 021, 867. 00
Salt springs and contiguous lands.....	46, 080. 00
Swamp.....	5, 656, 064. 03
Swamp-land indemnity.....	24, 038. 69
Canals.....	1, 250, 235. 85
Total.....	8, 787, 565. 57
Minnesota:	
Internal improvements.....	500, 000. 00
University.....	92, 160. 00
Public buildings.....	6, 400. 00
Agricultural college.....	120, 000. 00
Experimental forestry.....	20, 000. 00
Public park.....	8, 392. 51
Common schools, sections 16 and 36.....	2, 874, 951. 00
Salt springs and contiguous lands.....	46, 080. 00
Swamp.....	4, 693, 557. 88
Total.....	8, 361, 541. 39
Mississippi:	
Internal improvements.....	500, 000. 00
Seminary of learning.....	69, 120. 00
Seat of government.....	1, 253. 16
Agricultural college scrip.....	210, 000. 00
Common schools, section 16.....	824, 213. 00
Swamp.....	3, 288, 418. 50
Swamp-land indemnity.....	56, 781. 76
Total.....	4, 949, 786. 42
Missouri:	
Internal improvements.....	500, 000. 00
Seminary of learning.....	46, 080. 00
Seat of government.....	2, 560. 00
Agricultural college.....	330, 000. 00
Common schools, section 16.....	1, 221, 813. 00
Salt springs and contiguous lands.....	46, 080. 00
Swamp.....	3, 346, 936. 01
Swamp-land indemnity.....	81, 016. 69
Total.....	5, 574, 485. 70

Land and scrip granted to States and Territories for Educational and other purposes, 1928—Continued

	Acres
Montana:	
University.....	46,080.00
Agricultural college.....	140,000.00
Public buildings.....	182,000.00
Deaf and dumb asylum.....	50,000.00
Reform school.....	50,000.00
School of mines.....	100,000.00
Normal schools.....	100,000.00
Militia camp.....	640.00
Observatory for university.....	480.00
Biological station.....	160.00
Common schools, sections 16 and 36.....	5,198,258.00
Fort Assinniboine, for educational institutions.....	2,000.00
Total.....	5,869,618.00
Nebraska:	
Penitentiary.....	32,000.00
Internal improvements.....	500,000.00
University.....	46,080.00
Public buildings.....	12,800.00
Agricultural college.....	90,000.00
Common schools, sections 16 and 36.....	2,730,951.00
Salt Springs and contiguous lands.....	46,080.00
Dry-land agricultural experiments.....	800.00
Total.....	3,458,711.00
Nevada:	
Internal improvements.....	500,000.00
University.....	46,080.00
Penitentiary.....	12,800.00
Public buildings.....	12,800.00
Mining and mechanic arts.....	90,000.00
Common schools, sections 16 and 36, and lieu lands, act June 16, 1880.....	2,061,967.00
Total.....	2,723,647.00
New Hampshire: Agricultural college scrip.....	150,000.00
New Jersey: Agricultural college scrip.....	210,000.00
New Mexico:	
Act June 21, 1898—	
University.....	111,080.00
Saline land (university).....	1,622.86
Agricultural college.....	100,000.00
Improvement of Rio Grande.....	100,000.00
Penitentiary.....	50,000.00
Public buildings.....	32,000.00
Insane asylum.....	50,000.00
Deaf and dumb asylum.....	50,000.00
Reform school.....	50,000.00
Normal schools.....	100,000.00
School of mines.....	50,000.00
Blind asylum.....	50,000.00
Reservoirs.....	500,000.00
Miners' hospital.....	50,000.00
Military institute.....	50,000.00
Common schools, sections 16 and 36.....	4,355,662.00
Total.....	5,700,364.86

Land and scrip granted to States and Territories for Educational and other purposes, 1928—Continued

New Mexico—Continued.

Act June 20, 1910—

	Acres
University.....	200,000.00
Public buildings.....	100,000.00
Insane asylums.....	100,000.00
Penitentiaries.....	100,000.00
Deaf, dumb, and blind asylum.....	100,000.00
Miners' hospitals.....	50,000.00
Normal schools.....	200,000.00
Charitable, penal, and reformatory.....	100,000.00
Agricultural and mechanical colleges.....	150,000.00
School of mines.....	150,000.00
Military institutes.....	100,000.00
Payment of bonds issued by Grant and Santa Fe Counties.....	1,000,000.00
Common schools, sections 2 and 32.....	4,355,662.00
Reimbursement of certain counties and town of Silver City (act May 28, 1928).....	250,000.00
Total	6,955,662.00

New York: Agricultural college scrip.....	990,000.00
North Carolina: Agricultural college scrip.....	270,000.00

North Dakota:

State Historical Society.....	75.50
University.....	86,080.00
Agricultural college.....	130,000.00
Public buildings.....	82,000.00
Educational, charitable, etc.....	170,000.00
Deaf and dumb asylum.....	40,000.00
Reform school.....	40,000.00
School of mines.....	40,000.00
Normal school.....	80,000.00
Common schools, sections 16 and 36.....	2,495,396.00
Total	3,163,551.50

Ohio:

Internal improvements (canals and roads).....	1,019,071.98
Seminaries of learning.....	69,120.00
Agricultural college scrip.....	630,000.00
Common schools, section 16.....	724,266.00
Salt springs and contiguous lands.....	24,216.00
Swamp.....	26,251.95
Total	2,492,925.93

Oklahoma:

Normal schools.....	300,000.00
Oklahoma University.....	250,000.00
University preparatory school.....	150,000.00
Agricultural and mechanical college.....	250,000.00
Colored agricultural and normal university.....	100,000.00
Common schools, sections 16 and 36.....	1,375,000.00
Certain sections 13 and 33.....	669,000.00
Insane asylum.....	1,760.25
Total	3,095,760.25

Oregon:

Internal improvements.....	500,000.00
University.....	46,080.00
Public buildings.....	6,400.00
Agricultural college.....	90,000.00
Common schools, sections 16 and 36.....	3,399,360.00
Salt springs and contiguous lands.....	46,080.00
Public park.....	(¹)

¹ Area not yet determined.

Land and scrip granted to States and Territories for Educational and other purposes, 1928—Continued

		Acrea
Oregon—Continued:		
Swamp	-----	264, 212. 66
Total	-----	4, 352, 132. 66
Pennsylvania: Agricultural college scrip	-----	780, 000. 00
Rhode Island: Agricultural college scrip	-----	120, 000. 00
South Carolina: Agricultural college scrip	-----	180, 000. 00
South Dakota:		
University	-----	86, 080. 00
Agricultural college	-----	160, 000. 00
Public buildings	-----	82, 000. 00
Educational and charitable	-----	170, 000. 00
Deaf and dumb asylum	-----	40, 000. 00
Reform school	-----	40, 000. 00
School of mines	-----	40, 000. 00
Normal schools	-----	80, 000. 00
Missionary work	-----	160. 00
Military camp ground	-----	640. 00
Insane asylum	-----	640. 00
Common schools, sections 16 and 36	-----	2, 733, 084. 00
Public park	-----	1, 599. 39
Total	-----	3, 434, 203. 39
Tennessee: Agricultural college scrip	-----	300, 000. 00
Texas: Agricultural college scrip	-----	180, 000. 00
Utah:		
University	-----	156, 080. 00
Agricultural college	-----	200, 000. 00
Public buildings	-----	64, 000. 00
Insane asylum	-----	100, 000. 00
Deaf and dumb asylum	-----	100, 000. 00
Reform school	-----	100, 000. 00
School of mines	-----	100, 000. 00
Normal schools	-----	100, 000. 00
Blind asylum	-----	100, 000. 00
Reservoirs	-----	500, 000. 00
Miners' hospital	-----	50, 000. 00
Common schools, sections 2, 16, 32, and 36	-----	5, 844, 196. 00
Total	-----	7, 414, 276. 00
Vermont: Agricultural college scrip	-----	150, 000. 00
Virginia: Agricultural college scrip	-----	300, 000. 00
Washington:		
University	-----	46, 080. 00
Agricultural college	-----	90, 000. 00
Public buildings	-----	132, 000. 00
Educational and charitable	-----	200, 000. 00
Normal schools	-----	100, 000. 00
Scientific schools	-----	100, 000. 00
Common schools, sections 16 and 36	-----	2, 376, 391. 00
Total	-----	3, 044, 471. 00
West Virginia: Agricultural college scrip	-----	150, 000. 00

Land and scrip granted to States and Territories for Educational and other purposes, 1928—Continued

Wisconsin:		Acres
Canal.....		338, 626. 97
River improvement.....		683, 722. 43
Internal improvements.....		500, 000. 00
University.....		92, 160. 00
Public buildings.....		6, 400. 00
Agricultural college.....		240, 000. 00
Forestry.....		20, 000. 00
Common schools, section 16.....		982, 329. 00
Swamp.....		3, 251, 830. 42
Swamp-land indemnity.....		105, 047. 99
Total.....		6, 220, 116. 91
Wyoming:		
University.....		46, 080. 00
Agricultural college.....		90, 000. 00
Public buildings.....		107, 000. 00
Penitentiary.....		30, 000. 00
Insane asylum.....		30, 000. 00
Educational, penal, etc.....		290, 000. 00
Deaf and dumb asylum.....		30, 000. 00
Miners' hospital.....		30, 000. 00
Fish hatcheries.....		5, 480. 00
Poor farm.....		10, 000. 00
Common schools, sections 16 and 36.....		3, 470, 009. 00
Total.....		4, 138, 569. 00
Grand total.....		202, 707, 456. 93

GENERAL LAND OFFICE TABLE 9.—*State grants, fiscal year ended June 30, 1928*

Kind of selections	Pending and received			Disposed of			Pending June 30, 1928
	Pending July 1, 1927	Since received	Total	Ap- proved	Canceled	Total	
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Swamp.....	31, 035. 31	136, 789. 46	167, 824. 77	46, 069. 76	65, 543. 00	111, 612. 76	56, 212. 01
School indemnity.....	447, 926. 82	101, 881. 01	549, 807. 83	52, 589. 20	22, 007. 09	74, 596. 29	475, 211. 54
University.....	96. 36	194. 59	290. 95				290. 95
Penitentiaries.....	708. 10		708. 10	680. 00		680. 00	28. 10
Public buildings.....	12. 60		12. 60				12. 60
Educational, charitable, penal, and reformatory institutions.....	594. 22		594. 22	40. 00	81. 01	121. 01	473. 21
Deaf, dumb, and blind asylums.....	164. 13		164. 13	164. 13		164. 13	
Normal schools.....	561. 75		561. 75		37. 94	37. 94	523. 81
Bonds issued by Santa Fe and Grant Counties.....	2, 040. 00		2, 040. 00				2, 040. 00
Bonds issued by Maricopa, Pima, etc., Counties.....	40. 00		40. 00		40. 00	40. 00	
Public park.....	1, 272. 50		1, 272. 50				1, 272. 50
Scientific schools.....	383. 03		383. 03				383. 03
Total specific grants.....	5, 872. 69	194. 59	6, 067. 28	884. 13	158. 95	1, 043. 08	5, 024. 20
Grand total.....	484, 834. 82	238, 865. 06	723, 699. 88	99, 543. 09	87, 709. 04	187, 252. 13	536, 447. 75

GENERAL LAND OFFICE TABLE 10.—*State grants—Recapitulation*

State	Swamp confirmed	School indemnity confirmed	Other grants confirmed
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	-----	361.44	-----
California.....	-----	15,863.90	-----
Florida.....	485.57	239.83	-----
Idaho.....	-----	5,516.81	680.00
Louisiana.....	22,112.13	-----	-----
Michigan.....	141.70	-----	-----
Minnesota.....	23,209.37	-----	-----
Mississippi.....	120.99	-----	-----
Montana.....	-----	9,936.12	-----
New Mexico.....	-----	14,861.01	164.13
Utah.....	-----	1,167.54	-----
Washington.....	-----	4,642.55	-----
Wyoming.....	-----	-----	40.00
Total.....	46,069.76	52,589.20	884.13

GENERAL LAND OFFICE TABLE 11.—*Withdrawals under the act of March 15, 1910 (36 Stat. 237), during the fiscal year ended June 30, 1928*

States	Pending July 1, 1927	Applied for 1927-28	Rejected before withdrawal	Pending July 1, 1928	Remaining withdrawn July 1, 1927	Withdrawn 1927-28	Restored	Remaining withdrawn July 1, 1928
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Colorado.....	14,211.13	39,535.53	21,650.33	-----	-----	32,096.33	-----	32,096.33
Idaho.....	-----	175,263.87	175,263.87	-----	-----	-----	-----	-----
Oregon.....	3,324.45	-----	-----	3,324.45	12,064.06	-----	12,064.06	-----
Wyoming.....	-----	-----	-----	-----	761.15	-----	601.15	160.00
Total.....	17,535.58	214,799.40	196,914.20	3,324.45	12,825.21	32,096.33	12,665.21	32,256.33

GENERAL LAND OFFICE TABLE 12.—*Withdrawals under the act of March 15, 1910 (36 Stat. 237), from the passage of the act to June 30, 1928*

State	Applied for	Rejected before withdrawal	Withdrawn	Restored	Remaining withdrawn
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	33,270.76	-----	33,270.76	33,270.76	-----
Colorado.....	1,076,942.52	354,276.73	708,414.62	676,318.29	32,096.33
Idaho.....	809,131.62	462,885.81	346,245.81	346,245.81	-----
Montana.....	118,064.07	77,056.57	41,007.50	41,007.50	-----
Nevada.....	1,160,074.59	481,023.22	679,051.37	679,051.37	-----
New Mexico.....	383,951.62	368,090.02	15,861.60	15,861.60	-----
Oregon.....	503,842.12	227,438.98	273,118.53	272,958.53	160.00
Utah.....	697,917.28	334,607.97	363,309.31	363,309.31	-----
Wyoming.....	484,148.02	244,000.32	240,147.70	240,147.70	-----
Total.....	5,267,342.60	2,549,379.62	2,700,427.20	2,668,170.87	32,256.33

GENERAL LAND OFFICE TABLE 13.—*State desert-land segregations under section 4 of the act of August 18, 1894 (28 Stat. 372-422), and the acts amendatory thereof, commonly designated as the Carey Act, and the action taken thereon during the fiscal year ended June 30, 1928*

State	Pending July 1, 1927	Applied for 1927-28	Rejected before segregation	Pending July 1, 1928	Remaining segregated July 1, 1927	Segregated 1927-28	Canceled	Patented	Remaining segregated July 1, 1928
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	17,321.14	-----	-----	17,321.14	13,745.16	-----	-----	-----	13,745.16
Colorado.....	5,277.34	-----	-----	5,277.34	22,835.85	-----	75,133.89	-----	22,835.85
Idaho.....	-----	-----	-----	-----	105,347.90	-----	14,869.20	-----	90,478.70
Montana.....	-----	-----	-----	-----	29,212.15	-----	-----	-----	29,212.15
Nevada.....	5,440.00	-----	-----	5,440.00	1,809.99	-----	-----	-----	1,809.99
Oregon.....	-----	-----	-----	-----	107,173.22	-----	-----	-----	107,173.22
Utah.....	31,784.14	-----	-----	31,784.14	48,269.26	-----	-----	-----	48,269.26
Wyoming.....	52,181.75	-----	-----	52,181.75	453,847.08	-----	-----	639.33	453,207.75
Total.....	112,004.37	-----	-----	112,004.37	782,240.61	-----	90,003.09	639.33	766,732.08

GENERAL LAND OFFICE TABLE 14.—*State desert-land segregations under section 4 of the act of August 18, 1894 (28 Stat. 372-422), and the acts amendatory thereof, commonly designated as the Carey Act, and the action taken thereon from the passage of the act to June 30, 1928*

State	Applied for	Rejected before segregation	Segregated	Canceled	Patented	Reconveyed	Time to reclaim extended
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	31,226.30	160.00	13,745.16	-----	-----	-----	-----
Colorado.....	460,431.06	170,499.75	284,653.97	224,111.65	37,706.47	-----	54,634.32
Idaho.....	3,819,181.34	2,484,961.76	1,335,787.59	545,614.95	699,693.94	2,495.91	6,371.77
Montana.....	609,826.46	363,127.49	246,698.97	115,895.81	101,591.01	10,104.03	92,074.75
Nevada.....	185,445.85	143,197.26	36,808.59	33,420.00	1,578.60	-----	3,388.59
New Mexico.....	10,204.68	2,600.00	7,604.68	2,861.35	4,743.33	-----	-----
Oregon.....	791,615.27	309,349.90	388,876.87	197,461.97	84,241.68	6,014.49	167,843.82
Utah.....	606,704.00	433,104.92	141,814.94	56,305.70	37,239.98	-----	15,611.25
Washington.....	155,649.39	155,649.39	-----	-----	-----	-----	-----
Wyoming.....	1,792,237.70	325,316.77	1,414,739.18	759,411.12	202,120.01	5,017.23	261,456.33
Total.....	8,462,522.05	4,387,967.24	3,870,729.95	1,935,082.58	1,168,915.32	23,631.66	601,380.83

GENERAL LAND OFFICE TABLE 15.—*Withdrawals and restorations during fiscal year July 1, 1927-June 30, 1928*

State	Outstanding withdrawn July 1, 1927	Period July 1, 1927, to June 30, 1928, withdrawn	Restored	Outstanding withdrawn June 30, 1928
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
COAL LANDS				
Arizona.....	139,415	-----	-----	139,415
California.....	17,603	-----	-----	17,603
Colorado.....	4,177,681	-----	80	4,177,601
Idaho.....	4,761	-----	-----	4,761
Montana.....	8,224,955	-----	389,381	7,835,574
Nevada.....	83,673	-----	70	83,603
New Mexico.....	5,073,476	-----	-----	5,073,476
North Dakota.....	6,192,376	-----	-----	6,192,486
Oregon.....	4,361	-----	-----	4,361
Utah.....	3,664,530	-----	-----	3,664,530
Washington.....	692,075	-----	-----	692,075
Wyoming.....	2,260,404	-----	-----	2,260,404
Total.....	30,535,330	-----	389,531	30,145,799
HELIUM LANDS				
Utah.....	12,255	-----	-----	12,255
MINERAL LANDS				
Arizona.....	8,507	-----	-----	8,507

GENERAL LAND OFFICE TABLE 15.—*Withdrawals and restorations during fiscal year July 1, 1927–June 30, 1928—Continued*

State	Outstanding withdrawn July 1, 1927	Period July 1, 1927, to June 30, 1928, withdrawn	Restored	Outstanding withdrawn June 30, 1928
OIL LANDS				
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	92,496	.....	.....	92,496
California.....	1,178,392	.....	.....	1,178,392
Colorado.....	218,997	.....	.....	218,997
Louisiana.....	466,990	.....	.....	466,990
Montana.....	1,344,640	.....	.....	1,344,640
North Dakota.....	84,894	.....	.....	84,894
Utah.....	919,630	.....	.....	919,630
Wyoming.....	967,323	.....	3,960	963,363
Total.....	5,273,362	.....	3,960	5,269,402
OIL SHALE				
Colorado.....	77,560	.....	.....	77,560
Nevada.....	123	.....	.....	123
Utah.....	91,464	.....	.....	91,464
Total.....	169,147	.....	.....	169,147
PHOSPHATE LANDS				
Florida.....	78,237	.....	9,596	68,641
Idaho.....	652,864	.....	.....	652,864
Montana.....	279,904	.....	.....	279,904
Utah.....	301,945	.....	.....	301,945
Wyoming.....	994,969	.....	.....	994,969
Total.....	2,307,919	.....	9,596	2,298,223
POTASH LANDS				
California.....	90,678	.....	40	90,638
Nevada.....	39,492	.....	.....	39,492
New Mexico.....	7,418,437	.....	.....	7,418,437
Total.....	7,548,537	.....	40	7,548,497

GENERAL LAND OFFICE TABLE 16.—*Report of withdrawals made under the act of June 25, 1910 (36 Stat. 847), as amended by the act of August 24, 1912 (37 Stat. 497), also restorations therefrom, from July 1, 1927, to June 30, 1928*

WITHDRAWALS FOR AND RESTORATIONS FROM POWER SITE RESERVES

State	Withdrawals			Restorations				
	Num-ber	Date of ap-proval	Area	Num-ber	Date of ap-proval	Area	Out-standing July 1, 1927	Out-standing June 30, 1928
			<i>Acres</i>			<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alabama.....			.....			.....	120	120
Alaska.....			.....			.....	93,415	93,415
Arkansas.....			.....	422	June 20, 1928	360	22,254	21,894
Arizona.....			.....			.....	433,034	433,034
California.....			.....	111	May 12, 1928	57	291,113	291,056
Colorado.....	110	May 12, 1928	32		May 17, 1928	160	225,769	225,641
Idaho.....			.....	117		.....	201,694	201,694
Michigan.....			.....			.....	1,240	1,240
Minnesota.....			.....			.....	12,309	12,309
Montana.....			.....			.....	127,772	127,772
Nebraska.....			.....			.....	761	761
Nevada.....			.....			.....	27,492	27,492
New Mexico.....			.....			.....	61,449	61,449
Oregon.....	108	May 12, 1928	243	417	Dec. 5, 1927	2,763	.....	.....
			.....	418	Jan. 9, 1928	456	.....	.....
			.....	419	Jan. 30, 1928	25	.....	.....
			.....	420	Mar. 27, 1928	80	.....	.....
			.....	423	June 20, 1928	40	.....	.....
Utah.....			.....			3,364	382,179	379,058
Washington.....			.....			.....	441,304	441,304
Wyoming.....			.....	115	May 10, 1928	938	98,994	98,994
			.....			.....	81,263	80,325
Total.....			275			4,879	2,502,162	2,497,558

¹ Interpretation.

GENERAL LAND OFFICE TABLE 16.—*Report of withdrawals made under the act of June 25, 1910 (36 Stat. 847), as amended by the act of August 24, 1912 (37 Stat. 497), also restorations therefrom, from July 1, 1927, to June 30, 1928*—Continued

MISCELLANEOUS RESERVATIONS

State	Withdrawals			Restorations				
	Number	Date of approval	Area	Number	Date of approval	Area	Out-standing July 1, 1927	Out-standing June 30, 1928
			<i>Acres</i>			<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alaska.....							230,000	230,000
Arkansas.....							400	400
Arizona.....							88,860	88,860
California.....							34,699	34,699
Colorado.....							1,727	1,727
Nevada.....							29,080	29,080
Oregon.....							1,235,441	1,235,441
Utah.....							2,320	2,320
Washington.....							560	560
Total.....							1,623,087	1,623,087

WELL DRILLING RESERVES ACT OF JUNE 12, 1917 (40 STAT. 145)

Montana.....							40	40
Nevada.....							80	80
Total.....							120	120

POWER SITE DESIGNATIONS MADE UNDER ARIZONA AND NEW MEXICO ENABLING ACTS OF JUNE 20, 1910, (36 STAT. 557-575) AND OREGON-CALIFORNIA LAND GRANT AMENDMENT ACT OF JUNE 9, 1916 (39 STAT. 218)

Arizona.....				15	Nov. 25, 1927	2	2	761,127	761,125
New Mexico.....					Apr. 27, 1928	16		201,046	201,046
Oregon.....				17	June 21, 1928	40	56	1,123,363	1,123,305
Total.....								582,085,536	2,085,476

POWER SITE CLASSIFICATIONS MADE UNDER THE ACT OF MARCH 3, 1879 (20 STAT. 394)

Alabama.....								1,669	1,669
Alaska.....	186	Aug. 2, 1927	37						
	187	Sept. 10, 1927	500						
	188	Sept. 13, 1927	320						
	192	Nov. 14, 1927	27,000						
			27,857					43,005	70,862
Arizona.....								37,031	37,031
Arkansas.....								1,590	1,590
California.....	183	July 7, 1927	23,214						
	185	July 14, 1927	1,689						
	¹ 118	May 28, 1928	476						
	¹ 112	May 12, 1928	3,833						
			29,212					280,505	309,727
Colorado.....								189,111	189,111
Idaho.....	190	Nov. 5, 1927	6,008						
	197	Dec. 14, 1927	4,972						
	200	Apr. 30, 1928	51						
			11,031					183,755	194,786
Montana.....								53,450	53,450
Nevada.....								28,026	28,026
Oregon.....	193	Nov. 14, 1927	40						
	191	Nov. 5, 1927	4,976	¹ 104	Dec. 14, 1927	40			
	196	Dec. 14, 1927	6		June 21, 1928	21			
	198	Jan. 15, 1928	6,294	16	June 8, 1928	80			
	202	June 29, 1928	61				144		
			11,377					176,192	187,425
Utah.....	195	Dec. 5, 1927	160						
	194	Nov. 22, 1927	4,797						
			4,957					163,414	168,371
Washington.....								144,054	144,054
Wyoming.....	199	May 1, 1928	80					25,621	26,701
Total.....			84,514				144	1,327,433	1,411,803

¹ Interpretation

GENERAL LAND OFFICE TABLE 17.—*Withdrawals and restorations under the act of June 17, 1902 (32 Stat. 388), for fiscal year ended June 30, 1928*

State	Project	Restorations	Withdrawals
		<i>Acres</i>	<i>Acres</i>
Arizona.....	Yuma.....	40	
California.....	Klamath.....	40	
	Orland.....	50,000	
	Reservoir sites.....	19,840	
		69,880	
Colorado.....	Grand Valley.....	1,640	
	Uncompahgre.....	40	
		1,680	
Idaho.....	Gooding.....	40	17,000
	Minidoka.....	80	
	Mountain Home.....	160	
		280	
Montana.....	Lower Yellowstone.....	680	
	Milk River.....	1,800	
	Shoshone.....		40
	Sun River.....	80	
		2,560	
Nebraska.....	North Platte.....	7,200	
		7,200	
New Mexico.....	Carlsbad.....		2,880
	Hondo.....	40	
	Rio Grande.....	40	
		80	
North Dakota.....	Buford-Trenton.....	80	
	Lower Yellowstone.....	560	
		640	
Oregon.....	Chewaucan.....	16,320	
	John Day.....	280	
	Klamath.....	1,600	
	Umatilla.....	1,340	
		19,540	
South Dakota.....	Belle Fourche.....		480
Utah.....	Reservoir sites.....	2,080	
	Strawberry Valley.....	640	
		2,720	
Washington.....	Palouse.....	160	
	Yakima.....	21,800	
		21,960	
Wyoming.....	Riverton.....	160	
	Shoshone.....	280	79,360
		440	
Grand total.....		127,500	99,280

Also:

5 changes of the form of withdrawal.....

16,360 acres

1 adjustment of former withdrawal.....

840 acres

GENERAL LAND OFFICE TABLE 18.—*Public and Indian lands entered each year ended June 30 from 1922 to 1928, inclusive*

State or Territory	1922	1923	1924	1925	1926	1927	1928
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alabama.....	6,470.97	6,720.09	6,472	5,010	5,517	4,253	
Alaska.....	10,611.95	14,406.06	10,793	8,434	5,386	7,314	5,402
Arizona.....	1,082,849.11	416,666.74	293,431	204,241	170,815	224,466	372,659
Arkansas.....	44,603.56	44,700.02	38,929	27,296	34,851	25,136	23,833
California.....	577,332.26	515,136.57	416,762	365,458	339,837	337,691	388,974
Colorado.....	1,258,989.27	892,124.96	605,390	417,255	357,464	426,780	345,925
Florida.....	31,765.65	33,068.59	29,882	46,134	50,660	14,711	9,699
Idaho.....	542,929.63	322,423.50	218,816	204,809	212,092	213,392	160,958
Kansas.....	11,636.83	6,346.64	5,067	3,766			
Louisiana.....	3,270.10	9,943.09	3,281	2,297	2,623	3,109	
Michigan.....	5,601.72	6,034.03	3,003	2,523			
Minnesota.....	35,079.76	25,404.73	39,254	26,275	17,409	9,708	15,404
Mississippi.....	4,406.27	4,712.86	3,659	3,700			
Missouri.....	80.00						
Montana.....	1,561,117.01	743,953.23	510,671	353,759	358,384	363,023	393,860
Nebraska.....	25,097.45	27,137.03	12,719	15,939	8,541	11,911	19,373
Nevada.....	88,353.73	81,722.96	78,929	123,531	114,644	45,845	65,761
New Mexico.....	2,017,600.33	1,219,637.81	779,351	579,050	449,841	595,811	697,619
North Dakota.....	29,456.55	36,522.10	13,698	13,643	19,772	10,596	13,006
Oklahoma.....	27,056.28	21,155.40	13,841	16,612	15,360	10,511	
Oregon.....	505,155.03	331,629.91	250,960	209,085	146,473	220,512	138,373
South Dakota.....	235,553.26	159,007.22	100,561	67,850	67,044	61,874	66,174
Utah.....	362,035.27	134,163.46	230,385	241,911	332,895	282,513	213,082
Washington.....	194,338.59	151,051.05	245,063	120,439	27,363	19,309	22,847
Wisconsin.....	2,305.27	1,495.04	1,469	1,083			
Wyoming.....	1,703,457.60	1,029,838.47	652,026	580,392	502,985	701,049	767,704
General Land Office.....				94	3,490	5,324	5,768
Discontinued land offices.....				566			
Total.....	10,367,153.15	6,415,001.56	4,564,412	3,641,092	3,243,446	3,594,838	3,726,421

GENERAL LAND OFFICE TABLE 19.—*Public lands surveyed and remaining unsurveyed in public-land States, including Alaska*

States	Area	Surveyed during fiscal year ended June 30, 1928	Surveyed to June 30, 1928	Unsurveyed to June 30, 1928	Resurveyed during fiscal year ended June 30, 1928
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alabama	32,818,560		32,818,560		
Alaska	378,165,760	16,236	1,907,525	376,258,235	
Arizona	72,838,400	590,939	42,533,340	30,305,060	
Arkansas	33,616,000	60	33,616,000		32,950
California	99,617,280	21,935	82,771,418	16,845,862	228,560
Colorado	66,341,120	5,660	64,174,142	2,166,978	291,729
Florida	35,111,040	646	35,111,040		131
Idaho	53,346,560	237,984	39,220,403	14,126,157	
Illinois	35,867,520	174	35,867,520		
Indiana	23,068,800		23,068,800		
Iowa	35,575,040		35,575,040		
Kansas	52,335,360	14	52,335,360		
Louisiana	29,061,760	17,298	29,061,760		
Michigan	36,787,200	3	36,787,200		22,929
Minnesota	51,749,120	34	51,749,120		
Mississippi	29,671,680		29,671,680		
Missouri	43,985,280		43,985,280		
Montana	93,568,640	53,758	81,052,215	12,516,425	210,283
Nebraska	49,157,120	278	49,157,120		45,910
Nevada	70,285,440	178,572	46,878,112	23,407,328	30,707
New Mexico	78,401,920	101,126	65,823,972	12,577,948	130,995
North Dakota	44,917,120		44,917,120		
Ohio	26,073,600		26,073,600		
Oklahoma	44,424,960		44,424,960		
Oregon	61,188,480	114,220	55,181,316	6,007,164	910
South Dakota	49,195,520	22,585	49,041,717	153,803	91,656
Utah	52,597,760	158,204	37,408,636	15,189,124	23,112
Washington	42,775,040	45,587	36,175,367	6,599,673	6,895
Wisconsin	35,363,840	839	35,363,840		
Wyoming	62,460,160	5,765	58,940,818	3,519,342	249,004
Total	1,820,366,080	1,571,917	1,300,692,981	519,673,099	1,365,771

Aggregate area of surveys and resurveys accepted in the fiscal year 1928, 2,937,688 acres.

NOTE.—In Arkansas, Florida, Illinois, Kansas, Louisiana, Michigan, Minnesota, Nebraska, and Wisconsin, the lands surveyed last year were not regarded as public lands when the lands surrounding were originally surveyed, and are counted in the aggregate of each State.

GENERAL LAND OFFICE TABLE 20.—*Estimated area of existing national forests, June 30, 1928 (a little over 86 per cent is public)*

	<i>Acres</i>		<i>Acres</i>
Alabama	198,385	New Mexico	9,915,383
Alaska	21,397,757	North Carolina	1,690,252
Arizona	12,267,044	Oklahoma	61,640
Arkansas	1,690,224	Oregon	15,533,917
California	23,990,601	Pennsylvania	762,536
Colorado	14,758,499	Porto Rico	65,950
Florida	620,228	South Carolina	137,216
Georgia	672,094	South Dakota	1,266,325
Idaho	20,648,230	Tennessee	876,056
Illinois	10,710	Utah	7,993,665
Maine	115,558	Virginia	1,241,929
Michigan	209,172	Washington	11,398,941
Minnesota	1,966,804	West Virginia	806,921
Montana	19,110,845	Wyoming	8,732,848
Nebraska	207,129		
Nevada	5,246,406		
New Hampshire	870,554	Total area	184,403,819

Area added to national forests during year	927,235
Area excluded from national forests during year	461,522
Area within temporary forest withdrawals June 30, 1928	206,079
Area of existing national forests June 30, 1927	183,938,106
Area of existing national forests June 30, 1928	184,403,819

GENERAL LAND OFFICE TABLE 21.—Aggregate cash receipts from the disposal of public and Indian lands from May 20, 1785, to June 30, 1928

Fiscal year	Cash sale	Amount of fees and commissions	Receipts, leasing act, Feb. 25, 1920	Receipts from sales of Indian lands	Miscellaneous receipts	Aggregate receipts from all sources
May 20, 1785, to June 30, 1880						\$208,059,657.14
1881	\$3,534,550.98	\$860,833.65		\$1,006,691.63	\$6,727.90	5,408,804.16
1882	6,628,775.92	1,124,531.15		634,617.22	6,591.75	8,394,516.04
1883	9,657,032.28	1,423,329.10		625,404.27	8,118.05	11,713,883.70
1884	10,304,582.49	1,536,410.58		938,137.26	10,274.76	12,789,405.09
1885	6,223,926.74	1,462,188.06		933,483.52	8,821.86	8,628,420.18
1886	5,757,891.06	1,654,876.25		1,607,729.63	10,587.40	9,031,084.34
1887	9,246,321.33	1,537,600.39		1,484,302.30	20,784.85	12,289,008.87
1888	11,203,071.95	1,498,000.05		821,113.77	24,951.65	13,547,137.42
1889	8,018,254.50	1,251,971.23		389,524.72	26,150.89	9,685,901.34
1890	6,349,174.24	1,121,696.07		293,062.30	16,585.00	7,780,517.61
1891	4,160,099.07	944,938.65		318,333.42	5,849.00	5,429,220.14
1892	3,322,865.01	1,064,805.26		456,681.84	15,757.58	4,860,109.69
1893	3,193,280.64	998,184.65		284,752.65	3,516.20	4,479,734.14
1894	1,653,080.71	1,021,205.08		91,981.03	1,557.50	2,767,824.32
1895	1,116,090.07	750,710.59		149,879.48	16,773.89	2,033,454.03
1896	1,053,905.59	793,557.82		214,700.42	44,197.84	2,106,361.67
1897	917,911.19	678,469.55		438,716.31	52,834.23	2,087,931.28
1898	1,291,076.10	853,265.50		100,317.49	33,336.09	2,277,995.18
1899	1,703,988.32	890,702.17		442,913.73	32,533.12	3,070,137.34
1900	2,899,731.83	1,157,081.03		239,769.39	83,175.85	4,379,758.10
1901	2,966,542.86	1,340,894.29		585,661.27	79,062.37	4,972,160.79
1902	4,139,268.47	1,740,820.18		288,666.68	93,171.85	6,261,927.18
1903	8,960,471.18	1,597,147.48		308,939.14	158,185.85	11,024,743.65
1904	7,445,902.84	1,349,190.89		333,757.62	153,690.63	9,283,341.98
1905	4,849,766.06	1,286,621.93		791,807.67	89,615.72	7,017,811.38
1906	4,885,988.82	1,642,488.56		967,532.50	89,514.02	7,585,523.90
1907	7,728,114.30	1,819,159.21		1,892,805.70	113,098.79	11,553,178.00
1908	9,760,570.19	1,731,883.57		997,972.52	225,283.18	12,715,709.46
1909	7,698,337.03	1,536,890.67		2,334,885.47	330,136.61	12,216,415.39
1910	6,342,744.75	2,028,892.35		2,037,551.68	1,054,735.28	11,463,924.06
1911	5,783,693.39	1,461,514.30		2,822,600.71	1,822,119.20	11,089,927.60
1912	5,437,502.07	1,234,216.47		2,284,538.37	1,016,791.09	9,973,048.00
1913	2,746,546.52	1,540,994.15		2,118,469.34	1,549,494.80	6,955,504.81
1914	2,650,761.84	1,654,085.02		1,844,802.77	47,677.90	6,148,367.63
1915	2,331,368.44	1,581,805.48		1,556,630.97	28,386.01	5,394,948.20
1916	1,769,860.33	1,660,933.33		1,972,299.49	41,468.44	5,444,561.59
1917	1,935,954.53	1,641,860.14		2,445,429.64	126,386.23	6,149,630.54
1918	2,050,575.58	1,160,350.88		1,935,773.73	285,127.47	5,431,827.66
1919	1,464,718.99	1,194,472.10		1,387,781.74	256,701.33	4,303,674.16
1920	1,990,764.16	1,587,060.79		2,063,186.06	490,765.40	6,131,776.41
1921	1,546,705.72	1,715,190.52	\$9,725,977.31	903,371.93	616,951.88	14,508,197.36
1922	906,544.59	1,125,547.93	8,799,468.17	545,711.91	407,423.12	11,784,695.72
1923	645,505.61	828,897.84	7,580,035.57	473,001.68	173,007.02	10,700,447.72
1924	551,339.06	684,650.98	13,631,840.72	359,088.97	1,146,084.31	16,373,004.04
1925	638,396.13	563,767.14	8,278,708.62	337,090.46	948,232.24	10,766,194.59
1926	733,648.39	434,585.65	8,384,718.76	805,983.75	1,055,103.91	11,414,040.46
1927	612,132.72	495,604.70	6,669,585.81	620,694.66	803,679.36	9,201,697.25
1928	389,569.57	447,419.61	4,677,277.16	372,031.95	824,156.55	6,710,454.84
Total						593,324,284.72

¹ Includes reclamation water-right charges.

GENERAL LAND OFFICE TABLE 22.—*Amounts accrued and paid to States for purposes of education or of making public roads and improvements on account of grants 2, 3, and 5 per cent of net proceeds of sales of public lands lying within said States*

State	Total to June 30, 1926	Fiscal year 1927	Aggregate to June 30, 1927, inclusive
Alabama.....	\$1,081,652.49	\$762.05	\$1,082,414.54
Arizona.....	39,431.10	2,097.97	41,529.07
Arkansas.....	338,446.41	699.09	339,145.50
California.....	1,167,811.28	3,836.96	1,171,648.24
Colorado.....	519,986.57	336.03	520,322.60
Florida.....	144,939.56	-----	144,939.56
Idaho.....	302,979.79	434.40	303,414.19
Illinois.....	1,187,908.89	-----	1,187,908.89
Indiana.....	1,040,255.26	-----	1,040,255.26
Iowa.....	633,638.10	-----	633,638.10
Kansas.....	1,127,987.59	-----	1,127,987.59
Louisiana.....	470,156.28	104.81	470,261.09
Michigan.....	589,369.46	-----	589,369.46
Minnesota.....	595,114.83	308.91	595,423.74
Mississippi.....	1,072,066.64	738.80	1,072,805.44
Missouri.....	1,061,105.54	-----	1,061,105.54
Montana.....	581,727.05	572.78	582,299.83
Nebraska.....	574,626.40	-----	574,626.40
Nevada.....	48,548.84	295.83	48,844.67
New Mexico.....	148,482.90	388.78	148,871.68
North Dakota.....	539,034.10	32.97	539,067.07
Ohio.....	999,353.01	-----	999,353.01
Oklahoma.....	66,564.71	67.07	66,631.78
Oregon.....	760,372.83	1,231.49	761,604.32
South Dakota.....	348,536.40	51.78	348,588.18
Utah.....	167,912.17	5,450.91	173,363.08
Washington.....	434,779.11	859.26	435,638.37
Wisconsin.....	586,645.26	-----	586,645.26
Wyoming.....	314,719.61	976.21	315,695.82
Total.....	16,944,152.18	19,246.10	16,963,398.28

GENERAL LAND OFFICE TABLE 23.—*Amounts covered into the Treasury to the credit of the reclamation fund from sales of public lands and fees and commissions in the several States, under the act of June 17, 1902 (32 Stat. 388)*

State	Fiscal years 1901 to 1926	1927	Total for 27 years ended June 30, 1927
Arizona.....	2,237,388.87	68,635.02	2,306,023.89
California.....	7,553,359.03	137,173.45	7,690,532.48
Colorado.....	9,854,722.87	66,735.21	9,921,458.08
Idaho.....	6,772,772.74	28,933.26	6,801,706.00
Kansas.....	1,032,005.82	-----	1,032,005.82
Montana.....	14,867,241.38	65,989.01	14,933,230.39
Nebraska.....	2,086,725.26	777.13	2,087,502.39
Nevada.....	941,073.46	10,745.10	951,818.56
New Mexico.....	5,915,488.99	81,873.04	5,997,362.03
North Dakota.....	12,180,027.78	1,556.73	12,181,584.51
Oklahoma.....	5,922,213.64	1,043.79	5,923,257.43
Oregon.....	11,677,546.25	86,848.26	11,764,394.51
South Dakota.....	7,711,487.59	5,065.07	7,716,552.66
Utah.....	3,803,668.59	171,972.79	3,975,641.38
Washington.....	7,320,566.84	19,637.78	7,340,204.62
Wyoming.....	7,853,615.67	91,349.71	7,944,965.38
Total.....	107,729,904.78	838,340.35	108,568,245.13

GENERAL LAND OFFICE TABLE 24.—*Payments to States from receipts under the mineral leasing act of February 25, 1920, from the passage of the act to June 30, 1928*

State	1921-1924	1925	1926	1927	1928	Total
Alabama.....	\$32,047.50	\$345.00	\$345.00	\$586.76	\$1,138.54	\$34,462.80
California.....	2,001,375.57	377,136.96	433,475.44	445,601.48	521,319.18	3,778,908.63
Colorado.....	22,413.40	26,647.03	31,531.94	40,867.46	34,918.75	156,378.58
Idaho.....	140.08	-----	370.36	736.19	930.90	2,177.53
Louisiana.....	1,126.77	379.48	350.06	5,330.94	1,461.61	8,648.86
Montana.....	296,504.16	59,908.51	98,482.97	70,832.76	44,651.39	570,379.79
Nevada.....	-----	270.00	561.43	540.00	548.64	1,920.07
New Mexico.....	2,949.55	1,302.85	6,539.01	5,771.91	9,688.23	26,251.55
North Dakota.....	6,665.80	2,691.88	3,453.05	2,904.18	12,277.55	27,992.46
South Dakota.....	45.87	63.06	94.37	7.06	15.00	225.36
Utah.....	39,721.51	10,027.43	12,311.93	12,905.95	21,705.52	96,672.34
Washington.....	5,437.28	1,149.56	637.12	939.11	1,491.32	9,654.39
Wyoming.....	9,140,101.05	2,980,536.61	2,584,388.31	1,911,665.78	1,102,534.13	17,719,225.88
Total.....	11,548,528.54	3,460,458.37	3,172,540.99	2,498,689.58	1,752,680.76	22,432,898.24

GENERAL LAND OFFICE TABLE 25.—*Receipts under the mineral leasing act of February 25, 1920, from the passage of the act to June 30, 1928*

State	1921-1924	1925	1926	1927	1928	Total
Alabama.....	\$85,460.00	\$920.00	\$920.00	\$1,564.70	\$3,036.10	\$91,900.80
California.....	12,620,144.97	1,037,007.05	1,092,492.65	1,194,085.61	1,389,800.40	17,333,530.68
Colorado.....	59,918.21	71,284.73	94,418.49	109,046.73	96,839.41	431,507.57
Idaho.....	373.54	-----	923.62	1,963.16	2,482.41	5,742.73
Louisiana.....	3,142.14	925.31	882.73	14,215.85	3,897.63	23,063.66
Montana.....	739,107.50	172,684.19	249,690.59	188,897.36	119,070.36	1,469,450.00
Nevada.....	-----	720.00	1,497.15	1,440.00	1,463.05	5,120.20
New Mexico.....	7,865.44	3,474.26	17,437.35	15,391.77	25,835.27	70,004.09
North Dakota.....	17,775.45	8,136.01	8,630.37	7,744.47	32,740.14	75,026.44
South Dakota.....	122.32	168.15	251.66	18.83	40.00	600.96
Utah.....	105,195.03	26,821.99	32,749.62	34,870.58	58,081.38	257,718.60
Washington.....	14,155.93	3,065.49	1,698.98	2,504.28	3,976.86	25,401.54
Wyoming.....	26,084,061.24	6,953,501.44	6,883,125.55	5,097,775.42	2,940,091.00	47,958,554.65
Total.....	39,737,321.77	8,278,708.62	8,384,718.76	6,669,518.76	14,677,354.01	67,747,621.92

¹ This is the amount actually covered in the Treasury during the year and differs by \$76.85 from the other tables on account of moneys applied in one year and deposited in another.

GENERAL LAND OFFICE TABLE 26.—*Class, number, and area of patents issued during fiscal year ended June 30, 1928*

Class	Number	Area	Class	Number	Area
Abandoned military reservation.....	27	3,352.66	Miscellaneous cash.....	99	18,944.47
Agriculture college scrip.....	1	193.31	Private land claim.....	27	13,225.77
Cemetery site.....	1	40.00	Public sale.....	323	28,459.28
Choctaw scrip.....	1	162.03	Railroad.....	35	84,920.19
Coal.....	2	317.18	Reclamation homesteads.....	107	8,027.69
Coal deposits.....	1	(¹)	Reissue.....	368	(²)
Commuted homesteads.....	212	22,789.25	Sioux half breed scrip.....	4	318.99
Desert land.....	263	43,700.86	Small holding claim.....	28	540.09
Desert land segregation.....	2	1,039.33	Soldiers' additional.....	50	1,764.70
Forest exchange.....	36	14,507.68	Special acts (see below).....	68	13,295.743
Forest homesteads.....	197	21,496.14	Supplemental.....	3	203.86
Forest lieu selection.....	17	1,514.52	Supplemental, act, Apr. 14, 1914.....	336	(¹)
Homestead, final.....	1,688	199,718.22	Surveyor general scrip.....	1	200.00
Homestead, enlarged.....	1,114	288,199.51	Swamp.....	29	46,247.51
Homestead, stock-raising.....	3,460	1,387,277.80	Timber culture.....	18	2,586.12
Indian fee.....	1,352	(²)	Timber sales.....	64	(²)
Indian homestead.....	6	360.00	Timber and stone.....	195	17,482.05
Indian homestead (reservation).....	3	1,281.99	To complete record.....	142	(¹)
Indian trust.....	1,258	201,681.53	Town lots.....	681	297,356
Isaac Crow scrip.....	1	39.53	Town site, Hamilton.....	4	34.404
Military bounty land warrants.....	12	705.26	Valentine scrip.....	1	5.47
Mineral.....	356	52,892.278	Ware scrip.....	1	40.00
				12,594	2,477,866.771

¹ Area not counted.² Area reported elsewhere.

	Acres
Patented area under Kinkaid Act.....	2,152.45
Patented area under coal reserved.....	139,869.04
Patented area under act July 17, 1914 (oil, gas, phosphate, etc., reserved).....	53,776.18
Patented area not included in above report:	
Indian fee.....	173,606.442
Timber sales patented.....	7,386.02
Coal deposits.....	40.00
Patents under act of Apr. 14, 1914.....	68,176.98

GENERAL LAND OFFICE TABLE 27.—*Sales of Indian lands during fiscal year ended June 30, 1928*

Land offices and Indian tribes	Entries and segregations				Receipts, sales, and interest
	Number		Acres		
	Original	Final	Original	Final	
Arizona: Phoenix, town lots.....		36		2.00	\$228.76
California:					
Los Angeles, Yuma.....		1		40.00	523.50
Sacramento, Round Valley.....					50.45
State total.....		1		40.00	573.95
Colorado:					
Denver, Ute.....	221	162	79,649.83	68,503.55	77,363.07
Pueblo—					
Ute.....	3	9		1,607.32	490.00
Southern Ute.....	1	5		1,520.00	568.40
State total.....	225	176	79,649.83	71,630.87	78,421.47
Idaho:					
Blackfoot, town lots.....					100.80
Coeur d'Alene, Coeur d'Alene.....		2		317.65	309.52
State total.....		2		317.65	410.32

GENERAL LAND OFFICE TABLE 27.—*Sales of Indian lands during fiscal year ended June 30, 1928—Continued*

Land offices and Indian tribes	Entries and segregations				Receipts, sales, and interest
	Number		Acres		
	Original	Final	Original	Final	
Minnesota, Cass Lake:					
Chippewa.....	3	39	103.78	3,522.37	\$3,910.03
Red Lake.....					35.25
State total.....	3	39	103.78	3,522.37	3,945.28
Montana:					
Billings—					
Crow.....	2	51	340.00	10,322.22	6,437.96
Town lots.....		24			470.00
Great Falls—					
Fort Peck.....	73	275	13,443.90	59,369.71	194,554.76
Town lots.....		10			(1)
Flathead.....	1	8	60.00	799.42	2,611.55
Town lots.....		212			4,217.46
Villa sites.....		10			(1)
State total.....	76	590	13,843.90	70,491.35	208,291.73
Nevada: Carson City, Pyramid Lake.....					3,333.77
North Dakota, Bismarck:					
Fort Berthold.....	4	18	1,119.16	2,317.60	9,828.21
Town lots.....	27	45			1,783.75
Devils Lake.....		3		112.10	260.25
Standing Rock, act Feb. 14, 1913.....	9	6	1,331.57	1,136.78	3,636.34
State total.....	40	72	2,450.73	3,566.48	15,508.55
Oregon: The Dalles, Umatilla.....		1		112.22	153.58
South Dakota, Pierre:					
Rosebud, act Mar. 2, 1907.....					45.60
Rosebud, act Apr. 23, 1904.....		1		40.00	112.00
Rosebud, act May 30, 1910.....	1	12	40.00	2,242.50	1,842.76
Pine Ridge, act May 27, 1910.....	8	16	3,564.23	7,001.37	7,472.12
Standing Rock, act May 29, 1908.....	19	22	3,995.09	3,893.80	12,557.67
Standing Rock, act Feb. 14, 1913.....	5		603.90		1,148.11
Cheyenne River, act May 29, 1908.....	15	25	2,835.90	2,991.73	24,217.69
Town lots.....		6			554.07
State total.....	48	82	11,039.12	16,169.40	47,950.02
Utah, Salt Lake City:					
Uintah.....	1	13	76.39	1,576.40	2,089.48
Town lots.....		29			(1)
State total.....	1	42	76.39	1,576.40	2,089.48
Washington, Spokane:					
Colville, act July 1, 1892.....	10	11	1,252.01	827.69	
Colville, act Mar. 22, 1906.....	11	52	2,931.40	11,190.76	7,224.66
Town lots.....		12			(1)
State total.....	21	75	4,183.41	12,018.45	7,224.66
Wyoming: Cheyenne, Shoshone.....	5	7	555.75	1,867.33	963.81
General Land Office.....		4		360.00	2,936.57
Class totals:					
Homesteads.....	345	602	111,403.36	136,627.67	
Town lots.....	27	374			
Other entries.....	47	151	499.55	45,046.85	
Grand total.....	419	1,127	111,902.91	181,674.52	372,031.95

¹ Moneys received for these town lots included in aggregate "receipts, sales, and interest" for each reservation period. Other entries included in the same amount.

GENERAL LAND OFFICE TABLE 28.—Statement showing district land offices, acreage unappropriated, unreserved, and embraced in unperfected entries, as of July 1, 1928, and filings presented, entries made, entries perfected, receipts and expenses, during fiscal year ended June 30, 1928

States and offices	Statement as of July 1, 1928		Filings presented, entries made, entries perfected, receipts and expenses, during the fiscal year ended June 30, 1928											Relation of ex- penditure to revenue	
	Unappropriated and unreserved	Acres	Total filings, including applications under leasing act	Original entries		Entries perfected		Receipts			Expenses				
				Num- ber	Acres	Num- ber	Acres	Public lands	Indian lands	Total	Salaries and commis- sions of registers	Clerk hire, rent, and incidentals	Total		
Alaska:															
Anchorage 1			181	50	3,700	62	4,841	\$14,457.78				\$3,000.00	\$2,707.42	\$5,707.42	39.4
Farbanks 1			232	64	1,702	75	2,900	12,733.67				904.31	2,723.76	3,628.07	28.4
Nome 1			17	12		3	49	4,240.25				220.53		220.53	5.2
State total			430	126	5,402	140	7,790	31,431.70				4,124.84	5,431.18	9,556.02	
Arizona:															
Phoenix 1	18,199,100		1,892	1,152	372,659	376	72,249	54,828.56	\$228.76			3,000.00	11,523.08	14,523.08	26.3
Arkansas: Little Rock 1	218,911		440	319	23,833	188	16,126	13,228.55				3,000.00	5,746.00	8,746.00	66.1
California:															
Los Angeles 1	8,717,494		1,697	1,142	200,042	289	51,812	220,376.65	523.50			3,000.00	11,576.93	14,576.93	6.5
Sacramento 1	11,704,589		1,352	712	188,932	543	128,407	1,275,134.42	50.45	1,275,184.87		3,000.00	11,568.18	14,568.18	1.1
State total	20,422,083		2,959	1,854	388,974	832	180,219	1,495,511.07	573.95	1,496,085.02		6,000.00	23,145.11	29,145.11	
Colorado:															
Denver 1	6,196,516		1,745	462	150,331	403	121,872	100,065.49	77,363.07	177,428.56		3,000.00	10,821.80	13,821.80	7.7
Pueblo 1	1,520,605		760	391	115,944	419	109,973	67,186.91	1,038.40	68,245.31		3,000.00	7,718.50	10,718.50	15.7
State total	7,717,121		2,505	853	266,275	822	231,845	167,252.40	78,421.47	245,673.87		6,000.00	18,540.30	24,540.30	
Florida: Gainesville 1	11,506		299	136	9,699	214	21,541	10,239.03		10,239.03		2,547.50	3,838.75	6,386.25	62.3
Idaho:															
Blackfoot	10,509,412		1,139	442	156,328	283	69,062	34,537.45	100.80	34,638.25		3,000.00	7,624.33	10,624.33	30.6
Coeur d'Alene	255,445		141	32	4,630	85	6,441	11,888.69	309.52	12,198.21		2,251.91	2,826.00	5,077.91	41.6
State total	10,764,857		1,280	474	160,958	368	75,503	46,426.14	410.32	46,836.46		5,251.91	10,450.33	15,702.24	
Minnesota: Cass Lake	214,340		238	187	15,300	58	2,332	4,487.03	3,945.28	8,432.31		1,750.75	2,840.02	4,590.77	54.4

GENERAL LAND OFFICE TABLE 29.—*Recapitulation by classes of entries*—Continued

State	Homestead entries						State selections			Railroad selections		
	Number			Acres			Amount					
	Orig-inal	Final	Com-muted	Original	Final	Com-muted	Original	Final	Com-muted	Num-ber	Acres	Amount
Alaska.....	55	47	2	5,402.25	4,103.58	155.15	\$628.42	\$244.42	\$192.95			
Arizona.....	1,002	280	13	302,364.48	61,441.55	1,680.43	21,352.76	2,562.42	2,077.57	14	2,209.82	\$19.00
Arkansas.....	232	146	8	23,832.81	12,996.12	432.14	2,500.82	324.45	540.18			
California.....	1,531	614	31	331,998.95	153,804.74	3,638.92	29,063.63	7,383.82	5,158.74	144	18,143.06	374.00
Colorado.....	792	756	1	265,890.20	222,264.18	120.00	17,375.50	8,472.20	130.00			
Florida.....	129	176	59	9,602.71	16,324.18	4,657.56	1,081.02	438.24	10.00	5	96.66	10.00
Idaho.....	427	246	2	157,599.04	67,474.97	93.19	9,766.17	2,560.01	36.00	8	2,213.81	36.00
Minnesota.....	166	35		15,140.04	1,724.27		1,568.57	86.45				
Montana.....	1,109	1,038	2	345,421.54	274,486.95	80.00	25,271.15	11,930.44	110.00	60	33,221.53	426.00
Nebraska.....	151	83		19,372.90	13,076.93		1,847.07	383.31				
Nevada.....	117	92		41,833.58	24,288.58		2,820.60	954.21				
New Mexico.....	1,498	820		662,427.00	279,995.84		40,233.76	10,872.30		72	29,448.87	203.00
North Dakota.....	88	72	1	10,555.34	10,523.03	18.00	940.50	319.75	45.00			
Oregon.....	601	356	1	135,565.11	74,628.67	41.24	10,715.74	3,351.44	51.55	1	40.00	2.00
South Dakota.....	191	232	1	55,134.36	58,999.54	30.98	2,995.64	1,487.52	38.75			
Utah.....	442	196		202,200.09	66,832.73		12,571.78	2,731.91		13	4,256.29	68.00
Washington.....	62	51	1	13,410.66	11,388.98	80.00	1,275.56	597.13	200.00	9	5,252.91	74.00
Wyoming.....	1,686	1,323	3	763,296.87	451,691.31	473.25	46,545.63	17,865.23	591.56	3	370.92	8.00
General Land Office.....	90	104	19	5,767.60	9,503.16	1,207.14	674.67	298.13	1,518.88			
Indian commissions.....							7,176.28	4,872.66				
Total.....	10,429	6,607	144	3,366,815.53	1,815,549.31	12,708.00	236,405.27	77,676.04	16,599.86	329	95,253.87	1,220.00
										27	106,453.61	1,350.00

NOTE.—Homestead entries contained in abandoned military reservations are included in this table.

GENERAL LAND OFFICE TABLE 29.—*Recapitulation by classes of entries—Continued*

State	Abandoned military reservations											Excess payments		
	Sales			Original homesteads				Final homesteads						
	Num- ber	Acres	Amount	Num- ber	Acres	Fees and commis- sions	Pur- chase money	Num- ber	Acres	Fees and commis- sions	Pur- chase money	Num- ber	Acres	Amount
Alaska.....												2	5.11	\$7.07
Arizona.....								5	1,208.67	\$32.98	\$1,453.21	46	257.54	331.09
Arkansas.....												9	26.01	32.86
California.....												121	451.33	674.87
Colorado.....												70	369.06	482.78
Florida.....												10	38.01	45.88
Idaho.....												29	140.70	186.39
Illinois.....												1	1.70	2.13
Minnesota.....				2	313.15	\$31.90	\$116.60	39	6,874.55	262.68	5,742.02	58	331.03	449.39
Montana.....												5	33.63	42.05
Nebraska.....												7	33.96	42.86
Nevada.....												95	441.70	556.35
New Mexico.....												1	2.08	5.20
North Dakota.....												39	169.51	224.22
Oregon.....												12	47.67	59.50
South Dakota.....												56	272.86	358.31
Utah.....				1	640.00	34.00						2	2.93	7.33
Washington.....												147	652.80	870.44
Wyoming.....	2	20.28	\$89.50									3	10.02	13.60
General Land Office.....														
Total.....	2	20.28	89.50	3	953.15	65.90	116.60	44	8,083.22	295.66	7,195.23	713	3,287.65	4,392.02

NOTE.—Homestead entries in this table are counted in respective totals in classified homestead table.

GENERAL LAND OFFICE TABLE 29.—*Recapitulation by classes of entries—Continued*

Desert-land entries												
State	Number		Acres		Amount		Desert-land relief, act Mar. 4, 1915					Proof in the man- ner required of a homestead entry- man
							Election to purchase			Final		
	Original	Final	Original	Final	Original	Final	Num- ber	Acres	Amount	Num- ber	Acres	
Arizona.....	82	15	14,165.34	2,359.60	\$3,540.94	\$2,359.60	11	1,993.85	\$997.07	1	200.00	\$150.00
California.....	59	17	8,337.01	2,533.68	2,045.02	2,533.62				36	7,406.19	5,555.07
Colorado.....	4	15	384.92	2,069.42	96.23	2,069.45		80.00	40.00	16	3,486.16	2,615.03
Idaho.....	9	12	1,144.80	2,077.44	286.20	2,077.44				3	559.55	419.66
Montana.....	7	17	973.33	2,517.90	243.59	2,512.36	2	430.48	215.24	11	1,872.82	1,404.63
Nevada.....	31	15	5,732.20	2,653.19	1,435.22	2,657.37						160.00
New Mexico.....	1	2	40.00	310.38	10.00	311.00				3	560.00	420.00
Oregon.....	4	11	400.16	1,198.33	100.04	1,198.33				4	680.00	510.00
South Dakota.....										1	80.00	160.00
Utah.....	26	36	5,289.21	5,129.66	1,324.26	5,131.00				1	200.00	150.00
Washington.....										2	280.00	210.00
Wyoming.....	26	17	3,480.07	1,947.77	871.29	1,947.77	1	160.00	80.00	7	1,039.91	800.00
Total.....	249	157	39,947.04	22,797.37	9,652.79	22,797.94	14	2,664.33	1,332.31	85	16,364.63	12,294.39
												480.00

GENERAL LAND OFFICE TABLE 29.—Recapitulation by classes of entries—Continued

State	Applications				Filings				Fees		Number		Acres		Amounts	
	Timber and stone		Mineral lands		Mineral adverse claims		Preemption		Cancellations, amount	Received for reducing testimony to writing, etc.	Original	Final	Original	Final	Fees and commissions	Purchase money
	Number	Amount	Number	Amount	Number	Amount	Number	Amount								
Alaska.....	69	\$690			4	\$12	1	\$3	\$42	\$145.61	2	49	320.00	119.05		\$2,080.87
Arizona.....	35	350							14	1,033.74	1	35	320.00	3,492.70	\$6.00	1,849.17
Arkansas.....	27	\$270							71	567.03		3		254.11		147.67
California.....	21	210	64	640	22	66			41	1,833.25	5	31	420.00	3,115.58		1,517.00
Colorado.....	2	20	43	430	11	\$33	1	3	25	1,909.92		2		400.64		450.00
Florida.....	2	20							21	1,171.74		5		387.69		7.12
Idaho.....	14	140	43	430	1	3			9	891.00		8		680.00	4.00	743.43
Minnesota.....	20	200							30	374.75	2	2		1.90		
Montana.....	20	200			2	6			2	2,209.47	5	11	400.15	981.61	7.80	1,004.00
Nebraska.....	4	40	22	220					2	464.21						
Nevada.....	21	210							39	365.92		8		3,465.42		
New Mexico.....	2	20					3	9	5	1,574.56	8	720	1,280.00	644.32	13.57	11,321.70
North Dakota.....									12	1,223.81	30	108	2,367.45	5,729.79	1,098.71	566,454.42
Oregon.....	44	440	2	20					3	620.43						
South Dakota.....					2	4			31	1,064.62	8	21	1,260.00	13,280.00		800.00
Utah.....	36	360	1	10	10	30			31	1,064.62		1		120.00		150.00
Washington.....	7	70							63	236.36		13		1,223.31		1,330.10
Wyoming.....	6	60	3	30	1	3				2,135.27		20		2,161.51		13,779.03
General Land Office.....	22	220														
Indian commissions.....															568.96	
Total.....	169	1,690	340	3,400	6	60	12	36	408	17,949.75	59	1,037	6,047.60	36,057.63	1,699.04	601,644.51

GENERAL LAND OFFICE TABLE 30.—*Number of original stock-raising homestead entries, public and Indian, area of land entered, and fee and commissions paid in connection therewith, by land offices and State totals, from the passage of the act to June 30, 1928*

State and office	Number	Acres	Amount
Arizona: Phoenix.....	3,401	1,555,742.77	\$97,359.57
Arkansas: Little Rock.....	4	1,600.00	80.00
California:			
El Centro.....	34	16,949.27	960.87
Eureka.....	226	69,805.86	4,703.23
Independence.....	328	156,477.64	11,120.91
Los Angeles.....	460	199,475.94	14,518.45
Sacramento.....	1,680	646,209.34	47,338.04
San Francisco.....	1,975	788,714.59	51,072.19
Susanville.....	548	250,644.33	14,793.78
Visalia.....	971	371,163.68	29,074.23
Total.....	6,222	2,499,440.65	173,581.70
Colorado:			
Del Norte.....	570	276,759.09	15,382.27
Denver.....	1,684	667,894.12	45,488.90
Durango.....	560	268,006.31	15,549.23
Glenwood Springs.....	3,024	1,220,585.40	75,632.14
Hugo.....	30	3,813.51	396.97
Lamar.....	1,379	346,310.98	25,364.88
Leadville.....	911	439,687.25	25,324.45
Montrose.....	1,490	698,851.00	40,912.31
Pueblo.....	5,930	2,195,321.46	138,592.29
Sterling.....	576	99,872.63	8,434.86
Total.....	16,154	6,217,101.75	391,078.30
Idaho:			
Blackfoot.....	2,240	970,090.83	58,139.99
Boise.....	1,957	885,653.80	52,048.23
Coeur d'Alene.....	41	14,114.95	899.94
Hailey.....	1,265	581,043.12	34,819.23
Lewiston.....	299	85,601.96	6,014.90
Total.....	5,802	2,536,504.66	151,922.29
Kansas:			
Dodge City.....	96	30,233.17	2,060.67
Topeka.....	137	28,273.29	2,041.33
Total.....	233	58,506.46	4,102.00
Michigan: Marquette.....	5	1,820.90	95.50
Montana:			
Billings.....	1,563	568,004.05	40,426.39
Bozeman.....	545	150,488.02	14,578.65
Glasgow.....	2,081	659,170.08	44,739.31
Great Falls.....	1,585	526,699.63	37,142.56
Havre.....	1,651	483,454.32	33,876.82
Helena.....	1,796	713,028.17	51,894.07
Kalispell.....	10	2,822.72	205.91
Lewistown.....	1,383	422,691.84	29,888.40
Miles City.....	5,593	2,038,545.36	152,281.16
Missoula.....	191	69,402.91	5,999.14
Total.....	16,398	5,634,307.10	411,032.41
Nebraska:			
Alliance.....	284	52,591.22	3,687.05
Broken Bow.....	85	13,071.01	1,056.91
Lincoln.....	65	12,231.50	848.30
North Platte.....	3	360.00	34.00
O'Neill.....	5	680.00	52.00
Valentine.....	32	3,729.72	328.20
Total.....	474	82,663.45	6,006.46
Nevada:			
Carson City.....	263	128,907.07	7,608.26
Elko.....	397	221,882.98	12,878.15
Total.....	660	350,790.05	20,486.41

GENERAL LAND OFFICE TABLE 30.—*Number of original stock-raising homestead entries, public and Indian, area of and entered, and fee and commissions paid in connection therewith, by land offices and State totals, from the passage of the act to June 30, 1928—Continued*

State and office	Number	Acres	Amount
New Mexico:			
Clayton.....	1,471	413,223.00	\$28,107.10
Fort Sumner.....	2,751	1,070,955.78	67,035.99
Las Cruces.....	4,727	2,430,110.63	137,953.49
Roswell.....	5,306	2,281,544.35	138,572.24
Santa Fe.....	7,289	3,258,025.17	203,550.96
Tucumcari.....	918	269,114.84	17,713.22
Total.....	22,462	9,722,973.77	592,933.00
North Dakota:			
Bismarck.....	113	31,065.73	1,945.29
Dickinson.....	519	170,466.21	11,679.13
Minot.....	3	524.88	33.15
Williston.....	97	17,056.41	1,191.31
Total.....	732	219,113.23	14,848.88
Oklahoma: Guthrie.....	366	71,348.74	4,768.57
Oregon:			
Burns.....	1,077	484,758.92	29,411.36
La Grande.....	1,171	398,929.12	25,976.58
Lakeview.....	576	227,431.70	14,188.11
Roseburg.....	15	3,716.44	334.57
The Dalles.....	2,461	903,198.96	57,594.01
Vale.....	1,580	704,986.29	42,163.66
Total.....	6,880	2,723,021.43	169,668.29
South Dakota:			
Bellefourche.....	2,017	778,917.64	38,804.13
Gregory.....	316	114,645.06	5,781.45
Lemmon.....	694	176,524.27	10,714.36
Pierre.....	1,184	408,072.94	21,346.89
Rapid City.....	2,395	761,482.22	41,221.96
Timber Lake.....	386	137,680.14	7,107.66
Total.....	6,992	2,377,322.27	124,976.45
Utah:			
Salt Lake City.....	3,121	1,681,735.37	104,541.86
Vernal.....	115	57,586.82	3,287.32
Total.....	3,236	1,739,322.19	107,829.18
Washington:			
Seattle.....	5	2,101.11	201.66
Spokane.....	352	113,176.03	8,907.95
Vancouver.....	30	10,495.31	967.03
Walla Walla.....	203	54,587.19	4,365.33
Waterville.....	567	150,800.76	11,176.00
Yakima.....	256	115,434.96	11,178.00
Total.....	1,413	446,595.36	36,795.97
Wyoming:			
Buffalo.....	6,138	2,738,318.76	159,589.81
Cheyenne.....	6,671	2,825,125.45	200,180.32
Douglas.....	8,215	3,368,361.24	206,985.39
Evanston.....	845	446,872.11	28,644.83
Lander.....	1,214	577,891.53	33,671.82
Newcastle.....	6,245	2,245,795.68	145,026.25
Total.....	29,328	12,202,364.77	774,098.42
General Land Office.....	12	1,642.95	140.10
Fiscal year 1918.....	734	236,578.08	15,185.82
Fiscal year 1919.....	15,035	5,558,756.11	365,696.18
Fiscal year 1920.....	20,979	8,228,749.20	527,954.17
Fiscal year 1921.....	25,653	10,313,732.89	656,314.51
Fiscal year 1922.....	17,922	7,070,175.54	454,295.96
Fiscal year 1923.....	10,719	4,257,990.47	270,674.14
Fiscal year 1924.....	7,006	2,812,664.36	178,401.45
Fiscal year 1925.....	5,613	2,298,039.10	144,578.81
Fiscal year 1926.....	5,254	2,250,485.32	140,006.82
Fiscal year 1927.....	5,981	2,663,798.88	163,087.87
Fiscal year 1928.....	5,878	2,751,212.55	165,607.77
Grand total.....	120,774	48,442,182.50	3,081,803.50

GENERAL LAND OFFICE TABLE 31.—*Applications filed under the mineral leasing act of February 25, 1920, from the passage of the act to June 30, 1928*

Alabama: Montgomery.....	16	New Mexico:	
Alaska:		Clayton.....	37
Anchorage.....	1,410	Fort Sumner.....	147
Fairbanks.....	15	Las Cruces.....	3,119
Nome.....	155	Roswell.....	1,357
Total.....	1,580	Santa Fe.....	3,853
Arizona: Phoenix.....	1,787	Tucumcari.....	34
Arkansas:		Total.....	8,547
Caniden.....	2	North Dakota:	
Harrison.....	3	Bismarck.....	185
Little Rock.....	17	Dickinson.....	83
Total.....	22	Minot.....	7
California:		Williston.....	15
El Centro.....	982	Total.....	290
Eureka.....	60	Oklahoma: Guthrie.....	557
Independence.....	665	Oregon:	
Los Angeles.....	1,720	La Grande.....	11
Sacramento.....	410	Lakeview.....	22
San Francisco.....	931	Portland.....	19
Susanville.....	2	Roseburg.....	92
Visalia.....	14,937	The Dalles.....	20
Total.....	19,707	Vale.....	22
Colorado:		Total.....	186
Del Norte.....	45	South Dakota:	
Denver.....	2,046	Bellefourche.....	20
Durango.....	493	Lemmon.....	31
Glenwood Springs.....	3,134	Pierre.....	87
Lamar.....	68	Rapid City.....	116
Leadville.....	27	Timber Lake.....	2
Montrose.....	711	Total.....	256
Pueblo.....	1,403	Utah:	
Sterling.....	52	Salt Lake City.....	11,250
Total.....	7,979	Vernal.....	752
Florida: Gainesville.....	1	Total.....	12,002
Idaho:		Washington:	
Blackfoot.....	598	Seattle.....	93
Boise.....	66	Spokane.....	13
Coeur d'Alene.....	36	Vancouver.....	2
Hailey.....	126	Walla Walla.....	23
Total.....	826	Waterville.....	6
Kansas: Topeka.....	5	Yakima.....	67
Louisiana: Baton Rouge.....	262	Total.....	204
Michigan: Marquette.....	3	Wyoming:	
Mississippi: Jackson.....	15	Buffalo.....	1,494
Montana:		Cheyenne.....	2,177
Billings.....	809	Douglas.....	1,954
Bozeman.....	112	Evanston.....	6,778
Glasgow.....	1,106	Lander.....	1,581
Great Falls.....	5,501	Newcastle.....	890
Havre.....	680	Total.....	14,874
Helena.....	107	General Land Office.....	21
Kalispell.....	15	Grand total.....	81,564
Lewistown.....	1,486	Filings, Feb. 25 to June 30, 1920.....	4,853
Miles City.....	950	Filings, fiscal year 1921.....	10,575
Missoula.....	20	Filings, fiscal year 1922.....	4,785
Total.....	10,786	Filings, fiscal year 1923.....	5,823
Nebraska: Alliance.....	34	Filings, fiscal year 1924.....	6,067
Nevada:		Filings, fiscal year 1925.....	5,367
Carson City.....	1,345	Filings, fiscal year 1926.....	11,971
Elko.....	259	Filings, fiscal year 1927.....	26,509
Total.....	1,604	Filings, fiscal year 1928.....	5,614
		Grand total.....	81,564

GENERAL LAND OFFICE TABLE 32.—*Area of vacant, unappropriated, and unreserved public lands*¹

State	Area in acres		
	Surveyed	Unsurveyed	Total
Arizona.....	9, 473, 000	8, 726, 100	18, 199, 100
Arkansas.....	218, 911		218, 911
California.....	14, 662, 147	5, 759, 936	20, 422, 083
Colorado.....	6, 907, 931	809, 190	7, 717, 121
Florida.....	4, 232	7, 224	11, 506
Idaho.....	8, 812, 472	1, 952, 385	10, 764, 857
Minnesota.....	214, 340		214, 340
Montana.....	6, 980, 238	212, 080	7, 192, 318
Nebraska.....	28, 623		28, 623
Nevada.....	31, 449, 940	22, 429, 018	53, 878, 958
New Mexico.....	15, 617, 800	1, 251, 800	16, 869, 600
North Dakota.....	126, 474		126, 474
Oregon.....	13, 331, 292	92, 411	13, 423, 703
South Dakota.....	396, 200		396, 200
Utah.....	13, 501, 694	12, 493, 262	25, 994, 956
Washington.....	861, 935	15, 986	877, 921
Wyoming.....	16, 729, 273	781, 296	17, 510, 569
Grand total.....	139, 316, 552	54, 530, 688	193, 847, 240

¹ Circular No. 1159, vacant public lands, can be had on application to the Commissioner of the General Land Office, Washington, D. C., which shows by States, land districts, and counties the areas of vacant unappropriated, and unreserved public land, surveyed and unsurveyed, with a brief statement of their character.

BUREAU OF INDIAN AFFAIRS

INDIAN TABLE 1.—*Indian population of the United States, exclusive of Alaska, as of June 30, 1928*

State, jurisdiction, subdivision, and tribes	Total			Degree of blood					
				Full blood			Mixed blood		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total population ¹	355,901	124,540	120,142	(2)	(2)	(2)	(2)	(2)	(2)
Alabama (not under agent) ³	405	211	194	(2)	(2)	(2)	(2)	(2)	(2)
Arizona.....	46,901	22,898	22,352	(2)	(2)	(2)	(2)	(2)	(2)
Colorado River.....	1,139	631	508	951	537	414	188	94	94
Chemehuevi (Chemehuevi).....	255	133	122	78	46	32	177	87	90
Colorado River Reservation (Chemehuevi, Kawia, Cocopa, Mojave).....	399	223	176	395	220	175	4	3	1
Fort Mojave Subagency (Apache).....	485	275	210	478	271	207	7	4	3
Fort Apache (Chiricahua, Coyotero, Mimbreno, Mogollon Apache).....	2,656	1,360	1,296	2,656	1,360	1,296	0	0	0
Havasupai (Havasupai).....	194	102	92	194	102	92	0	0	0
Hopi.....	5,224	2,779	2,445	5,224	2,779	2,445	0	0	0
Hopi.....	2,474	1,312	1,162	2,474	1,312	1,162	0	0	0
Navajo ⁴	2,750	1,467	1,283	2,750	1,467	1,283	0	0	0
Kaibab Subagency, Paiute (Kaibab, Paiute).....	94	52	42	94	52	42	0	0	0
Leupp (Navajo).....	1,651	(2)	(2)	1,651	(2)	(2)	0	0	0
Phoenix School.....	1,729	926	803	1,724	924	800	5	2	3
Camp Verde Subagency (Mojave Apache).....	418	234	184	418	234	184	0	0	0
Salt River Subagency: Camp McDowell Reservation (Mojave Apache).....	1,311	692	619	1,306	690	616	5	2	3
Pima.....	5,535	2,851	2,684	5,535	2,851	2,684	0	0	0
Gila Bend Reservation (Papago).....	1,000	500	500	1,000	500	500	0	0	0
Gila River Reservation (Maricopa, Pima).....	4,535	2,351	2,184	4,535	2,351	2,184	0	0	0
San Carlos (Arivaipa, Chiricahua, Coyotero, Mimbreno, Mogollon, Mojave, Pinal, San Carlos, Tonto, Yuma Apache). Sells: Papago Reservation (Papago).....	2,545	1,334	1,211	2,465	1,285	1,180	80	50	30
Sells: Papago Reservation (Papago).....	5,209	2,679	2,530	5,166	2,653	2,513	43	26	17
Southern Navajo (Navajo) ⁴	12,602	6,055	6,547	12,602	6,055	6,547	0	0	0
Truxton Canyon: Walapai Reservation (Walapai).....	434	220	214	(2)	(2)	(2)	(2)	(2)	(2)
Western Navajo.....	7,889	3,909	3,980	7,889	3,909	3,980	0	0	0
Hopi.....	357	191	166	357	191	166	0	0	0
Navajo ⁴	7,500	3,700	3,800	7,500	3,700	3,800	0	0	0
Paiute.....	32	18	14	32	18	14	0	0	0
Arkansas (not under agent) ³	106	61	45	(2)	(2)	(2)	(2)	(2)	(2)

¹ Males plus females do not equal total population for the reason that for 111,219 of the total, information concerning sex is lacking.

² Data unavailable.

³ Fourteenth Census of the United States Bureau of the Census, 1920, Government Printing Office, 1923, Vol. III.

⁴ Annual Report of the Commissioner of Indian Affairs, fiscal year 1927, Government Printing Office, 1927, Table I.

INDIAN TABLE 1.—*Indian population of the United States, exclusive of Alaska, as of June 30, 1928*—Continued

State, jurisdiction, subdivision, and tribes	Total			Degree of blood					
				Full blood			Mixed blood		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
California	18,912	9,605	9,307	(2)	(2)	(2)	(2)	(2)	(2)
Bishop Subagency, Walker River: Camp or Fort Independence Reservation (Paiute).....	1,370	684	686	1,241	617	624	129	67	62
Fort Bidwell (Pit River, Paiute).....	629	320	309	588	301	287	41	19	22
Fort Yuma.....	867	460	407	799	422	377	68	38	30
Cocopah Reservation (Cocopah).....	24	14	10	24	14	10	0	0	0
Yuma Reservation (Yuma).....	843	446	397	775	408	367	0	0	0
Hoopa Valley (Honsading, Hupa, Klamath River, Miskut, Redwood, Saia, Sermalton, Tishtanatan) ¹	1,899	929	970	1,083	(2)	(2)	816	(2)	(2)
Mission (Diegueno, Kawia, San Luis Rey, Temecula).....	2,763	1,473	1,290	978	529	449	1,785	944	841
Augustine Reserve.....	17	9	8	16	8	8	1	1	0
Cabezon Reserve.....	31	17	14	28	14	14	3	3	0
Cahuilla Subagency.....	113	59	54	83	41	42	30	18	12
Campo Subagency.....	128	71	57	4	1	3	124	70	54
Capitan Grande Reserve.....	143	78	65	9	4	5	134	74	60
Cayapalpe Reserve.....	6	2	4	6	2	4	0	0	0
Inaja Reserve.....	32	16	16	6	5	1	26	11	15
Laguna Reserve.....	2	2	0	0	0	0	2	2	0
La Jolla Subagency.....	221	120	101	21	10	11	200	110	90
La Posta Reserve.....	4	2	2	0	0	0	4	2	2
Los Coyotes Reserve.....	98	59	39	50	31	19	48	28	20
Manzanita Reserve.....	52	24	28	1	0	1	51	24	27
Mesa Grande Subagency.....	198	116	82	35	19	16	163	97	66
Mission Creek Reserve.....	5	2	3	0	0	0	5	2	3
Morongo Reserve.....	284	144	140	127	72	55	157	72	85
Pala Subagency.....	209	107	102	95	52	43	114	55	59
Palm Springs Reserve.....	48	24	24	29	18	11	19	6	13
Pauma Reserve.....	66	32	34	29	12	17	37	20	17
Pechanga Reserve.....	212	110	102	64	32	32	148	78	70
Rincon Subagency.....	162	89	73	56	29	27	106	60	46
San Manuel Reserve.....	40	22	18	15	10	5	25	12	13
San Pascual Reserve.....	3	0	3	0	0	0	3	0	3
Santa Rosa Reserve.....	53	31	22	37	22	15	16	9	7
Santa Ynez Subagency.....	78	39	39	0	0	0	78	39	39
Soboba Subagency.....	115	60	55	52	30	22	63	30	33
Sycuan Reserve.....	38	19	19	18	7	11	20	12	8
Torres-Martinez Reserve.....	192	106	86	164	93	71	28	13	15
Volcan Subagency.....	213	113	100	33	17	16	180	96	84
Sacramento.....	11,384	5,739	5,645	(2)	(2)	(2)	(2)	(2)	(2)
Chuckchansi.....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Cold Springs Reservation.....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Colony or Nevada Reservation.....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Digger Reservation (Digger).....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mewuk Subagency.....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Round Valley Subagency (Clear Lake, Concow, Little Lake, Nomelaki, Pit River, Potter Valley, Redwood, Wailaki, Yuki).....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Tule River Subagency (Kawia, Kings River, Moache, Tejon, Tule, Wichumni).....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Colorado: Consolidated Ute.....	835	446	389	835	446	389	0	0	0
Allen Canyon Subagency.....	41	24	17	41	24	17	0	0	0
Southern Ute.....	368	189	179	368	189	179	0	0	0
Ute Mountain Subagency (Capote, Moache, Wiminuche Ute).....	426	233	193	426	233	193	0	0	0

² Data unavailable.³ Fourteenth Census of the United States Bureau of the Census, 1920, Government Printing Office, 1923, Vol. III.⁴ Annual Report of the Commissioner of Indian Affairs, fiscal year 1927, Government Printing Office, 1927, Table I.

INDIAN TABLE 1.—*Indian population of the United States, exclusive of Alaska, as of June 30, 1928—Continued*

State, jurisdiction, subdivision, and tribes	Total			Degree of blood					
				Full blood			Mixed blood		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Connecticut (not under agent) ²	159	79	80	(2)	(2)	(2)	(2)	(2)	(2)
Delaware (not under agent) ³	2	2	0	(2)	(2)	(2)	(2)	(2)	(2)
District of Columbia (not under agent) ²	37	20	17	(2)	(2)	(2)	(2)	(2)	(2)
Florida (Seminole).....	506	256	250	(2)	(2)	(2)	(2)	(2)	(2)
Georgia (not under agent) ²	125	68	57	(2)	(2)	(2)	(2)	(2)	(2)
Idaho	3,865	1,959	1,906	2,399	1,221	1,178	1,466	739	727
Coeur d'Alene (Coeur d'Alene, Kutenai, Pend d'Oreille, Spokane).....	708	354	354	434	218	216	274	137	137
Fort Hall (Bannock, Shoshoni).....	1,770	930	840	1,180	620	560	590	310	280
Fort Lapwai (Nez Perce).....	1,387	675	712	785	383	402	602	292	310
Illinois (not under agent) ³	194	108	86	(2)	(2)	(2)	(2)	(2)	(2)
Indiana (not under agent) ³	125	73	52	(2)	(2)	(2)	(2)	(2)	(2)
Iowa: Sac and Fox (Potawatomi, Sac and Fox of the Mississippi, Winnebago).....	397	206	191	397	206	191	0	0	0
Kansas: Potawatomi Subagency, Haskell Institute	1,541	807	734	523	(2)	(2)	1,018	(2)	(2)
Chippewa and Munsee Reservation (Chippewa and Munsee).....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Iowa Reservation (Iowa).....	341	177	164	4	(2)	(2)	337	(2)	(2)
Kickapoo Reservation (Kickapoo).....	280	144	136	11	(2)	(2)	269	(2)	(2)
Potawatomi Reservation (Prairie Band of Potawatomi).....	825	440	385	508	(2)	(2)	317	(2)	(2)
Sac and Fox Reservation (Sac and Fox of the Missouri).....	95	46	49	0	0	0	95	46	49
Kentucky (not under agent) ².....	57	27	30	(2)	(2)	(2)	(2)	(2)	(2)
Louisiana (not under agent) ³.....	1,066	550	516	(2)	(2)	(2)	(2)	(2)	(2)
Maine (not under agent) ².....	839	420	419	(2)	(2)	(2)	(2)	(2)	(2)
Maryland (not under agent) ².....	32	18	14	(2)	(2)	(2)	(2)	(2)	(2)
Massachusetts (not under agent) ³.....	555	262	293	(2)	(2)	(2)	(2)	(2)	(2)
Michigan	7,607	3,795	3,812	3,460	(2)	(2)	4,147	(2)	(2)
Mackinac Subagency, Lac du Flambeau.....	1,190	587	603	50	26	24	1,140	561	579
L'Anse Reservation (L'Anse and Vieux Desert Band of Chippewa of Lake Superior).....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Ontonagon Reservation (Ontonagon Band of Chippewa of Lake Su- perior).....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Ottawa and Chippewa (Scattered and unorganized bands) ⁴	6,417	3,208	3,209	3,410	(2)	(2)	3,007	(2)	(2)
Minnesota	15,310	7,718	7,592	2,026	(2)	(2)	13,284	(2)	(2)
Consolidated Chippewa.....	12,990	6,542	6,448	1,077	(2)	(2)	11,913	(2)	(2)
Fond du Lac Subagency (Fond du Lac Band of Chippewa of Lake Superior).....	1,448	775	673	71	(2)	(2)	1,377	(2)	(2)
Grand Portage Subagency (Grand Port- age Band of Chippewa of Lake Superior).....	394	169	225	4	(2)	(2)	390	(2)	(2)
Leech Lake Subagency: Mille Lac Reservation, White Oak Point Reser- vation (Cass Lake, Pillager, Lake Winnibigoshish Bands of Chippewa).....	1,930	1,005	925	605	(2)	(2)	1,325	(2)	(2)
Nett Lake Subagency: Bois Fort Reser- vation, Vermilion Lake Reservation (Bois Fort Chippewa).....	628	306	322	285	(2)	(2)	343	(2)	(2)
White Earth Subagency (Chippewa of the Mississippi, Pembina, Pillager Chippewa).....	8,590	4,287	4,303	112	(2)	(2)	8,478	(2)	(2)
Pipestone: Mdewakanton Reservation (Mdewakanton Sioux).....	554	274	280	71	32	39	483	242	241
Red Lake (Red Lake and Pembina Chip- pewa).....	1,766	902	864	878	438	440	888	464	424

² Data unavailable.³ Fourteenth Census of the United States Bureau of the Census, 1920, Government Printing Office, 1923, Vol. III.⁴ Annual Report of the Commissioner of Indian Affairs, fiscal year 1927, Government Printing Office, 1927, Table I.

INDIAN TABLE 1.—*Indian population of the United States, exclusive of Alaska, as of June 30, 1928—Continued*

State, jurisdiction, subdivision, and tribes	Total			Degree of blood					
				Full blood			Mixed blood		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Mississippi: Choctaw (Choctaw).....	1,496	781	715	1,496	781	715	0	0	0
Missouri (not under agent) ³	171	87	84	(2)	(2)	(2)	(2)	(2)	(2)
Montana.....	13,734	7,021	6,713	6,054	3,083	2,971	7,680	3,934	3,746
Blackfeet (Blackfeet, Blood, Piegan).....	3,469	1,792	1,677	1,123	571	552	2,346	1,221	1,125
Crow (Mountain and River Crow).....	1,892	964	928	1,166	608	558	726	356	370
Flathead (Bitter Root, Carlos Band, Flathead, Kutenai, Lower Kalispel, Pend d'Oreille).....	2,784	1,419	1,365	505	248	257	2,279	1,171	1,108
Fort Belknap (Gros Ventre, Assiniboin).....	1,215	633	582	739	379	360	476	250	226
Fort Peck (Assiniboin, Brule, Santee, Teton, Hunkpapa, Yanktonai Sioux).....	2,399	1,216	1,183	1,161	594	567	1,238	622	616
Rocky Boy's (Rocky Boy's).....	531	277	254	254	131	123	277	146	131
Tongue River: Northern Cheyenne Reservation (Northern Cheyenne).....	1,444	720	724	1,106	552	554	338	168	170
Nebraska.....	4,323	2,244	2,079	2,025	(2)	(2)	2,298	(2)	(2)
(Santee Subagency: Niobrara Reservation, Yankton, (Santee Sioux)	1,271	663	608	312	(2)	(2)	959	(2)	(2)
Ponca Subagency, Yankton (Ponca).....	381	184	197	36	(2)	(2)	345	(2)	(2)
Winnebago.....	2,671	1,397	1,274	1,677	894	783	994	529	465
Omaha Subagency (Omaha)	1,572	819	753	1,135	593	542	437	239	198
Winnebago Reservation (Winnebago).....	1,099	578	521	542	301	241	557	290	267
Nevada.....	4,920	2,446	2,474	4,645	2,298	2,347	275	148	127
Carson.....	2,671	1,296	1,375	2,636	1,278	1,358	35	18	17
Fort McDermitt Subagency: Summit Lake Reservation.....	319	151	168	319	151	168	0	0	0
Nevada Subagency (Paiute).....	504	232	272	498	230	268	6	2	4
Winnemucca and Battle Mountain Bands Shoshoni.....	1,848	913	935	1,819	897	922	29	16	13
Moapa River Subagency, Paiute (Chemehuevi, Kaibab, Pawipit, Paiute, Shivwits).....	196	103	93	188	99	89	8	4	4
Walker River.....	1,363	684	679	1,269	622	647	94	62	32
Fallon Subagency (Paiute).....	412	213	199	407	209	198	5	4	1
Mason-Smith Valley Yerington Colony (Paiute).....	434	208	226	410	192	218	24	16	8
Walker River Reservation (Paiute).....	517	263	254	452	221	231	65	42	23
Western Shoshone.....	690	363	327	552	299	253	138	64	74
Duck Valley Reservation (Paiute, Western Shoshoni).....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Shoshoni and Paiute Reservation.....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
New Hampshire (not under agent) ³	28	13	15	(2)	(2)	(2)	(2)	(2)	(2)
New Jersey (not under agent) ³	100	56	44	(2)	(2)	(2)	(2)	(2)	(2)
New Mexico.....	22,786	11,877	10,909	(2)	(2)	(2)	(2)	(2)	(2)
Eastern Navajo.....	3,709	1,870	1,839	3,709	1,870	1,839	0	0	0
Canoncito, Puertecito, Ramah Bands of Navajo.....	709	370	339	709	370	339	0	0	0
Navajo ⁴	3,000	1,500	1,500	3,000	1,500	1,500	0	0	0
Jicarilla (Jicarilla-Apache).....	636	342	294	633	340	293	3	2	1
Mescalero (Mescalero and Mimbreno Apache).....	675	339	336	592	301	291	83	38	45
Northern Navajo (Navajo) ⁴	7,000	3,500	3,500	7,000	3,500	3,500	0	0	0

² Data unavailable.³ Fourteenth Census of the United States Bureau of the Census, 1920, Government Printing Office, 1923, Vol. III.⁴ Annual Report of the Commissioner of Indian Affairs, fiscal year 1927, Government Printing Office, 1927, Table I.

INDIAN TABLE 1.—*Indian population of the United States, exclusive of Alaska, as of June 30, 1928—Continued*

State, jurisdiction, subdivision, and tribes	Total			Degree of blood					
				Full blood			Mixed blood		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
New Mexico—Continued.									
Northern Pueblos (Pueblo).....	3, 158	1, 698	1, 460	3, 112	1, 681	1, 431	46	17	29
Cochiti Pueblo.....	272	138	134	272	138	134	0	0	0
Nambe Pueblo.....	129	64	65	111	59	52	18	5	13
Pajoque Pueblo.....	8	4	4	8	4	4	0	0	0
Picuris Pueblo.....	119	58	61	119	58	61	0	0	0
San Ildefonso Pueblo.....	106	59	47	106	59	47	0	0	0
San Juan Pueblo.....	500	260	240	487	252	235	13	8	5
Santa Clara Pueblo.....	361	198	163	355	197	158	6	1	5
Santo Domingo Pueblo.....	877	509	368	877	509	368	0	0	0
Taos Pueblo.....	673	350	323	664	347	317	9	3	6
Tesuque Pueblo.....	113	58	55	113	58	55	0	0	0
Southern Pueblos (Pueblo).....	5, 720	3, 072	2, 648	(2)	(2)	(2)	(2)	(2)	(2)
Acoma Pueblo.....	1, 012	543	469	(2)	(2)	(2)	(2)	(2)	(2)
Isleta Pueblo.....	1, 043	568	475	(2)	(2)	(2)	(2)	(2)	(2)
Jemez Pueblo.....	624	343	281	(2)	(2)	(2)	(2)	(2)	(2)
Laguna Pueblo.....	2, 017	1, 028	989	(2)	(2)	(2)	(2)	(2)	(2)
Sandia Pueblo.....	111	56	55	(2)	(2)	(2)	(2)	(2)	(2)
San Felipe Pueblo.....	519	297	222	(2)	(2)	(2)	(2)	(2)	(2)
Santa Ana Pueblo.....	227	140	87	(2)	(2)	(2)	(2)	(2)	(2)
Sia Pueblo.....	167	97	70	(2)	(2)	(2)	(2)	(2)	(2)
Zuni Pueblo (Zuni).....	1, 888	1, 056	832	1, 865	1, 041	824	23	15	8
New York.....	4, 419	2, 273	2, 146	(2)	(2)	(2)	(2)	(2)	(2)
Alleghany Reservation (Onondaga, Seneca).....	1, 169	597	572	(2)	(2)	(2)	(2)	(2)	(2)
Cattaraugus Reservation (Cayuga, Onondaga, Seneca).....	1, 563	769	794	(2)	(2)	(2)	(2)	(2)	(2)
Oil Spring Reservation (Seneca) ⁵	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Oneida Reservation.....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Onondaga Reservation (Oneida, Onondaga, St. Regis).....	673	335	338	(2)	(2)	(2)	(2)	(2)	(2)
St. Regis Reservation (St. Regis).....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Tonawanda Reservation (Cayuga and Tonawanda Bands of Seneca).....	573	320	252	(2)	(2)	(2)	(2)	(2)	(2)
Tuscarora Reservation (Onondaga, Tuscarora).....	441	252	189	(2)	(2)	(2)	(2)	(2)	(2)
North Carolina.....	12, 309	6, 307	6, 002	(2)	(2)	(2)	(2)	(2)	(2)
Cherokee, Qualla Boundary (Eastern Band of Cherokee).....	2, 951	1, 569	1, 382	1, 347	705	642	1, 604	864	740
Not under agent (Croatan) ⁴	9, 358	4, 738	4, 620	(2)	(2)	(2)	(2)	(2)	(2)
North Dakota.....	10, 390	5, 290	5, 100	3, 870	1, 972	1, 898	6, 520	3, 334	3, 186
Fort Berthold (Arikara, Gros Ventre, Mandan).....	1, 373	688	685	811	409	402	562	279	283
Fort Totten: Devils Lake Reservation (Assiniboin, Cuthead, Santee, Sisseton, Yankton, Wahpeton Sioux).....	935	498	437	646	324	322	289	174	115
Standing Rock (Blackfeet, Hunkpapa, Upper and Lower Yanktonai Sioux).....	3, 666	1, 839	1, 827	2, 237	1, 141	1, 096	1, 429	714	715
Turtle Mountain (Pembina Chippewa).....	4, 416	2, 265	2, 151	176	98	78	4, 240	2, 167	2, 073
Ohio (not under agent) ³	151	94	57	(2)	(2)	(2)	(2)	(2)	(2)
Oklahoma.....	119, 335	7, 834	7, 715	(2)	(2)	(2)	(2)	(2)	(2)
Cheyenne and Arapaho (Southern Arapaho and Southern Cheyenne).....	2, 680	1, 384	1, 296	2, 102	1, 072	1, 030	578	312	266
Cantonment Subagency.....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Seger Subagency.....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

² Data unavailable.³ Fourteenth Census of the United States Bureau of the Census, 1920, Government Printing Office, 1923, Vol. III.⁴ Annual Report of the Commissioner of Indian Affairs, fiscal year 1927, Government Printing Office, 1927, Table I.⁵ Data included in census of Alleghany Reservation.

INDIAN TABLE 1.—*Indian population of the United States, exclusive of Alaska, as of June 30, 1928—Continued*

State, jurisdiction, subdivision, and tribes	Total			Degree of blood					
				Full blood			Mixed blood		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oklahoma—Continued. Five Civilized Tribes ²	101,506	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Cherokee Nation	41,824	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
By blood	36,432	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
By intermarriage	286	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Delawares	187	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Freedmen	4,919	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Chickasaw Nation	10,966	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
By blood	5,659	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
By intermarriage	645	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Freedmen	4,662	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Choctaw Nation	26,828	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
By blood	17,488	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
By intermarriage	1,651	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mississippi Choctaws	1,660	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Freedmen	6,029	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Creek Nation	18,761	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
By blood	11,952	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Freedmen	6,809	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Seminole Nation	3,127	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
By blood	2,141	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Freedmen	986	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Kiowa	5,290	2,646	2,644	4,104	2,030	2,074	1,186	616	570
Fort Sill Apache Reservation	88	49	39	85	47	38	3	2	1
Apache, Kiowa, and Comanche Reservation (Apache, Comanche, Delaware, Kiowa)	3,910	1,957	1,953	3,147	1,549	1,598	763	408	355
Wichita Reservation (Ioni, Comanche, Delaware, Tawakoni, Waco, Wichita)	1,292	640	652	872	434	438	420	206	214
Osage (Great and Little Osage)	2,882	1,478	1,404	778	408	370	2,104	1,070	1,03
Pawnee	2,766	1,375	1,391	1,170	(2)	(2)	1,596	(2)	(2)
Kaw Reservation (Kaw)	445	224	221	78	(2)	(2)	367	(2)	(2)
Oakland Reservation (Tonkawa, Lipan)	49	26	23	34	18	16	15	8	
Otoe Reservation (Otoe, Missouri)	669	345	324	337	179	158	332	166	166
Pawnee Reservation (Pawnee)	835	411	424	561	275	286	274	136	138
Ponca Subagency (Ponca)	768	369	399	160	84	76	608	285	323
Quapaw	1,931	951	980	77	(2)	(2)	1,854	(2)	(2)
Ottawa Reservation (Ottawa of Blanchards Fork and Roche de Boeuf)	265	131	134	1	(2)	(2)	264	(2)	(2)
Quapaw Reservation (Quapaw)	349	165	184	67	(2)	(2)	282	(2)	(2)
Seneca Reservation (Seneca, Eastern Shawnee, Kickapoo)	794	394	400	9	(2)	(2)	785	(2)	(2)
Wyandot Reservation (Wyandot)	523	261	262	0	0	0	523	261	262
Shawnee	2,280	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Absentee Shawnee	569	292	277	441	216	225	128	76	52
Iowa Reservation (Kiowa, Tonkawa)	98	43	55	93	41	52	5	2	3
Kickapoo Reservation (Mexican Kickapoo)	194	94	100	186	90	96	8	4	4
Pottawatomini Reservation (Absentee Shawnee, Citizen Pottawatomini)	725	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Sac and Fox Subagency (Ottawa, Sac and Fox of the Mississippi)	694	343	351	550	274	276	144	69	75

² Data unavailable.⁶ The Final Rolls of Citizens and Freedmen of the Five Civilized Tribes in the Indian Territory, prepared by the Commission and Commissioner to the Five Civilized Tribes, 1907, Government Printing Office, 1907.

INDIAN TABLE 1.—*Indian population of the United States, exclusive of Alaska, as of June 30, 1928—Continued*

State, jurisdiction, subdivision, and tribes	Total			Degree of blood					
				Full blood			Mixed blood		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oregon.....	6,731	2,209	2,322	(2)	(2)	(2)	(2)	(2)	(2)
Klamath (Klamath, Modoc, Paiute, Pit River, Walpapi, Yahuskin Band of Shoshoni)	1,274	603	671	603	293	310	671	310	361
Not under agent ⁴	2,200	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Salem.....	1,138	588	550	411	212	199	727	376	351
Fourth-section allottees.....	352	185	167	118	61	57	234	124	110
Grand Ronde Subagency (Kalapuya, Clackama, Cow Creek, Lakmiut, Marys River, Molala, Nestucca, Rogue River, Santiam, Shasta, Tumwater, Umpqua, Wapato, Yamhill).....	336	175	161	40	21	19	296	154	142
Siletz Subagency (Aalsea, Coquille, Kusa, Kwatami, Rogue River, Skoton, Shasta, Siuslaw, Tututni, Umpqua, and 13 others).....	450	228	222	253	130	123	197	98	99
Umatilla (Cayuse, Umatilla, Wallawalla).....	1,107	518	589	438	189	249	669	329	340
Warm Springs (Des Chutes, John Day, Paiute, Tenino, Warm Springs, Wasco).....	1,012	500	512	941	454	487	71	46	25
Pennsylvania (not under agent) ³	337	196	141	(2)	(2)	(2)	(2)	(2)	(2)
Rhode Island (not under agent) ³	110	59	51	(2)	(2)	(2)	(2)	(2)	(2)
South Carolina (not under agent) ³	304	145	159	(2)	(2)	(2)	(2)	(2)	(2)
South Dakota.....	23,124	11,878	11,246	(2)	(2)	(2)	(2)	(2)	(2)
Cheyenne River (Blackfeet, Miniconjou, Sans Arcs, Two Kettle Sioux).....	3,040	1,540	1,500	1,545	789	756	1,495	751	744
Crow Creek.....	1,503	754	749	815	374	441	688	380	308
Crow Creek Reservation.....	913	445	468	566	254	312	347	191	156
Lower Brule Subagency (Lower Brule and Lower Yankton Sioux).....	590	309	281	249	120	129	341	189	152
Flandreau (Sioux).....	312	165	147	141	79	62	171	86	85
Pine Ridge (Brule Sioux, Northern Cheyenne, Oglala Sioux).....	7,833	3,994	3,839	(2)	(2)	(2)	(2)	(2)	(2)
Rosebud (Loafer, Miniconjou, Northern Oglala, Two Kettle, Upper Brule and Wazhazhe Sioux).....	5,975	3,072	2,903	3,338	1,740	1,598	2,637	1,332	1,305
Sisseton: Lake Traverse Reservation (Sisseton and Wahpeton Sioux).....	2,457	1,341	1,116	931	482	449	1,526	859	667
Yankton (Yankton Sioux).....	2,004	1,012	992	523	258	265	1,481	754	727
Tennessee (not under agent) ³	56	33	23	(2)	(2)	(2)	(2)	(2)	(2)
Texas (not under agent) ³	2,109	1,181	928	(2)	(2)	(2)	(2)	(2)	(2)
Utah.....	1,574	822	752	1,326	700	626	248	122	126
Paiute.....	402	197	205	402	197	205	0	0	0
Goshute Subagency.....	160	82	78	160	82	78	0	0	0
Paiute Reservation.....	14	7	7	14	7	7	0	0	0
Scattered bands.....	103	46	57	103	46	57	0	0	0
Shirwits Subagency.....	82	40	42	82	40	42	0	0	0
Skull Valley Reservation.....	43	22	21	43	22	21	0	0	0
Uintah and Ouray.....	1,172	625	547	924	503	421	248	122	126
Uintah Valley Reservation (Goshute, Pavant, Uintah, Yampa, Grand River, Uncompahgre, White River Ute).....	1,052	565	487	812	445	367	240	120	120
Uncompahgre Reservation (Tabeguache Ute).....	120	60	60	112	58	54	8	2	6
Vermont (not under agent) ³	24	15	9	(2)	(2)	(2)	(2)	(2)	(2)
Virginia (not under agent) ³	824	423	401	(2)	(2)	(2)	(2)	(2)	(2)

² Data unavailable.³ Annual Report of the Commissioner of Indian Affairs, fiscal year, 1927, Government Printing Office, 927 Table I.⁴ Fourteenth Census of the United States Bureau of the Census, 1920, Government Printing Office, 1293, Vol. III.

INDIAN TABLE 1.—*Indian population of the United States, exclusive of Alaska, as of June 30, 1928—Continued*

State, jurisdiction, subdivision, and tribes	Total			Degree of blood					
				Full blood			Mixed blood		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Washington.....	13, 573	6, 697	6, 876	(2)	(2)	(2)	(2)	(2)	(2)
Colville.....	3, 678	1, 814	1, 864	1, 610	803	807	2, 068	1, 012	1, 056
Colville Reservation (Coeur d'Alene, Colville, Kalispel, Okinagan, Lake Methow, Nespelem, Pend d'Oreille, Sanpoil, Spokane).....	2, 949	1, 470	1, 479	1, 352	692	660	1, 597	778	819
Spokane Subagency (Spokane).....	729	344	385	258	111	147	471	234	237
Kalispel Reservation, Coeur d'Alene.....	84	46	38	83	46	37	1	0	1
Neah Bay.....	663	336	327	609	305	304	54	27	27
Hoh, Ozette, and Quileute Reservations (Hoh, Ozette, Quileute).....	227	113	114	210	103	107	17	10	7
Makah Reservation (Makah, Quileute).....	436	223	213	399	202	197	37	17	20
Taholah.....	2, 765	1, 367	1, 398	(2)	(2)	(2)	(2)	(2)	(2)
Chehalis Reservation (Chinook, Clatsop, Chehalis).....	86	49	37	64	41	23	22	8	14
Nisqualli Reservation (Muckleshoot, Nisqualli, Puyallup, Skwawksnamish, Steilacoomamish, and 5 others).....	63	36	27	26	14	12	37	22	15
Quinalt Reservation (Quaitso, Quileute, Quinalt).....	1, 022	503	519	589	305	284	433	198	235
Shoalwater Reservation (Shoalwater, Chehalis).....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Skokomish Reservation (Clallam, Skokomish, Twana).....	172	79	93	80	35	45	92	44	48
Squaxon Island Reservation (Nisqualli, Puyallup, Skwawksnamish, Steilacoomamish, and 5 others).....	46	24	22	28	14	14	18	10	8
Unattached.....	1, 376	676	700	(2)	(2)	(2)	(2)	(2)	(2)
Tulalip.....	3, 409	1, 740	1, 669	1, 822	(2)	(2)	1, 587	(2)	(2)
Clallam Band.....	782	413	369	204	(2)	(2)	578	(2)	(2)
Lummi Reservation (Dwamish, Etakmehu, Lummi, Snohomish, Suquamish, Swiwamish).....	607	310	297	318	(2)	(2)	289	(2)	(2)
Muckleshoot Reservation (Muckleshoot).....	207	96	111	149	(2)	(2)	58	(2)	(2)
Nooksak Indians.....	208	116	92	142	(2)	(2)	66	(2)	(2)
Puyallup Reservation (Nisqualli, Puyallup, Muckleshoot, Skwawksnamish, Steilacoomamish, and 5 others).....	299	147	152	299	(2)	(2)	0	0	0
Skagit: Suittatle Band.....	199	106	93	147	(2)	(2)	52	(2)	(2)
Snohomish or Tulalip Reservation (Dwamish, Etakmehu, Lummi, Snohomish, Suquamish, Swiwamish).....	550	265	285	262	(2)	(2)	288	(2)	(2)
Suquamish or Port Madison Reservation (Dwamish, Etakmehu, Lummi, Snohomish, Suquamish, Swiwamish).....	161	88	73	54	(2)	(2)	107	(2)	(2)
Swinomish Reservation (Dwamish, Etakmehu, Lummi, Snohomish, Suquamish).....	279	140	139	209	(2)	(2)	70	(2)	(2)
Unattached Tulalip and Muckleshoot Indians.....	117	59	58	38	(2)	(2)	79	(1)	(2)
Yakima (Klikitat, Paloos, Topinish, Wasco, Yakima).....	2, 974	1, 394	1, 580	(2)	(2)	(2)	(2)	(2)	(2)
West Virginia (not under agent) ¹	7	4	3	(2)	(2)	(2)	(2)	(2)	(2)

² Data unavailable.³ Fourteenth Census of the United States Bureau of the Census, 1920, Government Printing Office, 1923, Vol. III.

INDIAN TABLE 1.—*Indian population of the United States, exclusive of Alaska, as of June 30, 1928—Continued*

State, jurisdiction, subdivision, and tribes	Total			Degree of blood					
				Full blood			Mixed blood		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Wisconsin.....	11,427	3,956	3,889	(2)	(2)	(2)	(2)	(2)	(2)
Hayward: Lac Court Oreille Reservation (Lac Court Oreille Band of Chippewa of Lake Superior).....	1,377	670	707	211	103	108	1,166	567	599
Keshena.....	5,522	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Menominee Reservation (Menominee).....	1,940	1,010	930	477	256	221	1,463	754	709
Oneida Reservation (Oneida) ⁴	2,976	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Stockbridge Reservation (Stockbridge and Munsee) ⁴	606	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Lac du Flambeau.....	3,157	1,606	1,551	(2)	(2)	(2)	(2)	(2)	(2)
Lac du Flambeau Reservation (Lac du Flambeau Band of Chippewa of Lake Superior).....	812	387	425	503	226	277	309	161	148
Laona Subagency.....	586	317	269	(2)	(2)	(2)	(2)	(2)	(2)
Rice Lake Band of Chippewas ⁴	170	89	81	(2)	(2)	(2)	(2)	(2)	(2)
Wisconsin Band of Potawatami.....	416	228	188	405	223	182	11	5	6
La Pointe Subagency (La Pointe Band of Chippewa of Lake Superior).....	1,759	902	857	160	80	80	1,599	822	777
Bad River Reservation.....	1,175	601	574	141	66	75	1,034	535	499
Red Cliff Reservation.....	584	301	283	19	14	5	565	287	278
Tomah: Grand Rapids Subagency (Wis- consin Potawatami).....	1,371	670	701	984	480	504	387	190	197
Wyoming: Shoshone—Wind River Reser- vation (Northern Arapaho and Eastern Band of Shoshoni).....	1,963	1,010	953	(2)	(2)	(2)	(2)	(2)	(2)

³ Data unavailable.⁴ Annual Report of the Commissioner of Indian Affairs, fiscal year 1927, Government Printing Office, 1927, Table I.

NOTE.—At 8 agencies, namely, Western Navaho, Northern Pueblos, Southern Pueblos, Yakima, Bishop Subagency (Walker River), Rocky Boys, Carson, and Grand Rapids Subagency (Tomah School) a decrease in population for 1928 in comparison with 1927 is shown.

The population figures have in some instances been based on estimates. The policy has been established to obtain more accurate data and at the first 4 named agencies, actual enumerations have been made during 1928 with the resulting decreases.

For the other 4, the explanation for the apparent inconsistency is that the table of vital statistics does not show the total number of births and deaths which have occurred on a given reservation but the number reported to Government officials.

Total population.....	355,901	Montana.....	13,744
Alabama.....	405	Nebraska.....	4,323
Arizona.....	46,901	Nevada.....	4,920
Arkansas.....	106	New Hampshire.....	28
California.....	18,912	New Jersey.....	100
Colorado.....	835	New Mexico.....	22,786
Connecticut.....	159	New York.....	4,419
Delaware.....	2	North Carolina.....	12,309
District of Columbia.....	37	North Dakota.....	10,390
Florida.....	506	Ohio.....	151
Georgia.....	125	Oklahoma.....	119,335
Idaho.....	3,865	Oregon.....	6,731
Illinois.....	194	Pennsylvania.....	337
Indiana.....	125	Rhode Island.....	110
Iowa.....	397	South Carolina.....	304
Kansas.....	1,541	South Dakota.....	23,124
Kentucky.....	57	Tennessee.....	56
Louisiana.....	1,066	Texas.....	2,109
Maine.....	839	Utah.....	1,574
Maryland.....	32	Vermont.....	24
Massachusetts.....	555	Virginia.....	824
Michigan.....	7,607	Washington.....	13,573
Minnesota.....	15,310	West Virginia.....	7
Mississippi.....	1,496	Wisconsin.....	11,427
Missouri.....	171	Wyoming.....	1,963

INDIAN TABLE 2.—*Indian school population, number eligible for school attendance, number in schools, etc., and capacity of Government schools provided for Indian children during fiscal year ended June 30, 1928*

States and jurisdictions	Indian children enrolled in schools							Capacity of Government schools								
	Number school children 6 to 18 years, inclusive	Number under 6 or over 18 in school	Total eligibles (columns 2 and 3)	Total number in school	Eligibles not in school	Government schools			Mission and private		Public	Reser- vation board- ing	Reser- vation day	Total capa- city		
						Non- reser- vation board- ing	In other reser- vation board- ing	Day	Total Govern- ment	Board- ing					Day	
Grand total.....	81,620	76,491	1,886	78,377	66,958	11,419	9,777	10,584	672	4,141	25,174	7,547	34,163	10,381	5,360	25,766
Arizona.....	11,175	9,840	410	10,250	8,652	1,598	2,799	2,947	4	1,053	6,803	1,531	318	2,897	1,254	4,151
Camp Verde Subagency (under Phoenix).....	120			120	82	38	10	32			42		40			80
Colorado River.....	241	214	14	228	187	41	64	78			142	4	41	80		440
Fort Apache.....	786	733	18	751	590	161	22	382		83	487	99	4	360	35	35
Havasupai.....	50	50	8	58	58	0	48			10	58					
Hopi Agency—																
Hopi.....	675	652	43	695	695	0	315			350	665	11	19	148	380	528
Navajo.....	455	448		448	438	10	223	184			407	1	30			
Kaibab (under Paute Utah).....	30	27		27	25	2	21	4			25					
Leupp.....	562	517	28	545	406	139	92	303			395	1	10	400	22	400
Pima.....	1,465	1,292	94	1,386	1,091	295	336	248		169	753	303	35	230	240	470
Salt River (under Phoenix).....	456	312	23	335	335	0	191	3		97	291	38	6	122	122	316
San Carlos.....	645	574	27	601	511	90	31	201		59	291	163	57	216	100	240
Sells.....	1,528	1,310	48	1,358	1,076	282	395			191	586	464	26	240	240	810
Southern Navajo.....	2,914	2,803	86	2,889	2,502	387	875	1,080		57	2,012	447	43	810	225	225
Truxton Canon.....	70	70		70	70	0					70					
Western Navajo.....	1,178	718	21	739	586	153	197	345		37	579		7	308	35	343
California.....	4,263	3,575	210	3,785	3,644	141	730	355	3	174	1,262	54	2,328	465	247	712
Bishop Subagency (under Walker River, Nev.).....	346	266		266	266	0	82				82	1	183			
Fort Bidwell.....	173	142	7	149	142	7	13	63	3		79		63	100		100
Fort Yuma.....	200	169	7	176	176	0	46	113			159	4	13	200	200	200
Hoopa Valley.....	1,920	693	57	750	750	0	123	179			302		448	165	165	165
Mission Agency.....	496	490	104	594	475	119	96			83	179	44	252	140	140	140
Sacramento Agency.....	2,128	1,815	35	1,850	1,835	15	370			91	461	5	1,369	107	107	107

233	221	221	15	885	764	175	46	20	117	1	138	37	250	250
Colorado: Consolidated Ute.....														
Idaho.....	939	870	15	885	764	175	121	99	189	17	305	243	310	340
Coeur d'Alene.....	184	171	2	173	123	50	50	13		17	30	21	30	30
Fort Hall.....	423	399	3	402	359	43	54	156			210	121	200	200
Fort Lapwai Sanatorium.....	332	300	10	310	282	28	32	33			65	101	110	110
Iowa: Sac and Fox.....	122	120	1	121	108	13	44	6		49	99	9	70	70
Kansas: Potawatomi.....	248	248		248	248	0	145			25	170	78	30	30
Michigan: Mackinac Subagency (under Lac du Flambeau, Wis.).....	320	320		320	275	45	55				55	1100		
Minnesota.....	5,050	4,619	32	4,651	4,401	250	581	234		144	959	2,838	230	393
Consolidated Chippewa.....	4,391	4,010	25	4,035	3,839	196	530	26		144	700	2,647		163
Pipestone.....	129	129		129	129	14	14				14	115		
Red Lake.....	530	480	7	487	433	54	37	208			245	76	230	230
Mississippi: Choctaw.....	438	393	11	404	197	207				152	152	45		170
Montana.....	4,013	3,727	136	3,863	3,600	263	363	497		88	1,131	2,031	456	643
Blackfeet.....	1,026	980	1	981	938	43	94	134		21	271	508	144	174
Crow.....	501	453	76	529	464	65	42				142	342		
Flathead.....	866	810	47	857	789	03	132				132	488		
Fort Belknap.....	348	341	4	345	321	24	76	124		33	233	63	112	142
Fort Peck.....	738	662		662	657	5		138		65	203	454	120	120
Rocky Boy.....	154	135		135	89	46	14	12		50	76	8	40	40
Tongue River.....	380	346	8	354	342	12	5	89		78	174	108	80	167
Nebraska.....	1,383	1,242	87	1,329	896	433	381				381	351		
Santee (under Yankton, S. D.).....	404	399	13	412	187	225	95				95	44		
Ponca (under Yankton, S. D.).....	160	158	6	164	68	96	39				39	29		
Winnebago.....	332	297	39	336	319	17	118				118	109		
Omaha Subagency.....	467	388	29	417	322	95	129				129	169		
Nevada.....	855	659	17	676	638	38	226			22	453	177	505	505
Carson Agency.....														
Moapa River Subagency (under Paute, Utah).....	41	34	2	36	31	5					22	9	150	150
Walker River Agency.....	297	217	2	219	218	1	89			62	151	63	125	125
Fallon Subagency.....	85	77		77	77	0	24			34	58	18	65	65
Walker River.....	114	77	2	79	78	1	37			28	65	12	60	60
Smith and Mason Valley.....	98	63		63	63	0	28				28	33		
Western Shoshone Agency.....	220	191	11	202	171	31	48			81	129	42	105	105

INDIAN TABLE 2.—*Indian school population, number eligible for school attendance, number in schools, etc., and capacity of Government schools provided for Indian children during fiscal year ended June 30, 1928—Continued*

States and jurisdictions	Indian children enrolled in schools						Capacity of Government schools									
	Number school children 6 to 18 years, inclusive	Number under 6 or over 18 in school	Total eligibles (columns 2 and 3)	Total number in school	Eligibles not in school	Government schools				Mission and private		Public	Reser- vation board- ing	Reser- vation day	Total capa- city	
						Non-reser- vation board- ing	Reser- vation board- ing	In other reser- vation board- ing	Day	Total Govern- ment	Board- ing					Day
New Mexico.....	5, 030	4, 749	266	5, 015	4, 572	443	861	1, 356	351	1, 207	3, 775	718	---	1, 100	1, 418	2, 518
Eastern Navajo.....	800	700	100	1 800	754	46	174	422	---	---	596	158	---	350	30	380
Jicarilla.....	156	124	4	128	64	64	37	111	---	---	148	60	---	---	---	110
Mescalero.....	174	141	18	159	157	2	135	744	92	---	971	7	---	110	---	560
Northern Navajo.....	1, 080	1, 080	27	1, 107	996	111	---	---	259	454	713	128	---	18	560	560
Northern Pueblos.....	885	876	23	899	845	54	---	---	---	---	---	---	---	---	---	527
Southern Pueblos.....	1, 442	1, 359	77	1, 436	1, 302	134	414	---	---	636	1, 050	197	---	---	681	681
Zuni.....	493	469	17	486	454	32	97	79	---	117	293	161	---	80	180	260
North Carolina: Cherokee.....	948	856	54	910	549	361	27	382	---	76	485	---	---	300	80	380
North Dakota.....	3, 268	2, 926	57	2, 983	2, 249	734	574	410	---	86	1, 070	205	64	452	152	604
Fort Berthold.....	370	359	29	388	375	13	172	---	---	39	211	107	---	---	52	52
Fort Totten.....	260	229	5	234	201	33	11	141	---	---	152	---	---	49	250	250
Standing Rock.....	969	930	18	948	835	113	113	269	---	37	419	63	64	202	70	272
Turtle Mountain.....	1, 669	1, 408	5	1, 413	838	575	278	---	---	10	288	35	---	---	30	30
Oklahoma.....	29, 303	29, 030	244	29, 274	24, 435	4, 839	1, 399	2, 150	118	---	3, 667	1, 161	---	2, 141	---	2, 141
Cheyenne and Arapaho Agency.....	776	716	22	738	589	149	38	161	53	---	252	4	---	224	---	224
Kiowa.....	1, 504	1, 534	152	1, 686	1, 534	152	94	445	---	---	539	19	---	445	---	445
Osage.....	924	873	33	906	906	0	13	---	---	---	13	77	---	---	---	---
Pawnee Agency.....	380	366	---	366	363	3	79	62	---	---	141	8	---	160	---	160
Pawnee and Kaw Subagency.....	257	248	9	257	200	57	41	19	---	---	60	---	---	140	---	140
Ponca Subagency.....	608	689	4	693	508	185	15	304	---	---	319	---	---	260	---	260
Quapaw.....	653	583	24	607	595	12	49	---	65	---	114	32	---	---	---	---
Shawnee.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

	24, 021	24, 021		24, 021	19, 740	4, 281	1, 070	1, 159		2, 229	1, 021	16, 490	1, 052		1, 052
Five Civilized Tribes.....															
Cherokee Nation.....															
Chickasaw Nation.....															
Choctaw Nation.....															
Creek Nation.....															
Seminole Nation.....															
Oregon.....															
Klamath.....															
Salem Subagency.....															
Umatilla.....															
Warm Springs.....															
South Dakota.....															
Cheyenne River.....															
Crow Creek.....															
Lower Brule Subagency.....															
Flandreau.....															
Pine Ridge.....															
Rosebud.....															
Sisseton.....															
Yankton.....															
Utah.....															
Uintah and Ouray.....															
Scattered Bands under Patute.....															
Washington.....															
Colville Agency.....															
Spokane Subagency.....															
Nehalem Bay.....															
Taholah.....															
Tulalip.....															
Yakima.....															
Wisconsin.....															
Grand Rapids Subagency (under Tomah).....															
Hayward.....															
Keshena Agency (Menominee).....															
Lac du Flambeau Agency—															
Lac du Flambeau.....															
Laona Subagency.....															
LaPointe (Bad River and Red Cliff).....															

1 Estimated.

3 Information not available.

INDIAN TABLE 2.—Indian school population, number eligible for school attendance, number in schools, etc., and capacity of Government school provided for Indian children during fiscal year ended June 30, 1928—Continued

States and jurisdictions	Number school children 6 to 18 years, inclusive	Number under 6 or over 18 in school	Total eligible (columns 2 and 3)	Total number in school	Eligibles not in school	Indian children enrolled in schools					Capacity of Government schools	
						Government schools			Mission and private		Reser- vation board- ing	Total capa- city
						Non- reser- vation board- ing	Reser- vation board- ing	In other reser- vation board- ing	Day	Board- ing		
Wyoming: Shoshone	534	517	517	478	39	41	118			159	135	135
Florida	187	177	185	18	167			18		18	15	15
Capacity of nonreservation schools												10,025

Indian children of school age	81,620
Indian children eligible for school attendance	76,491
Government schools:	
Boarding	7,547
Day	74
Public schools	7,621
Total all classes	34,163
Number of eligible children not in school	66,958
	11,419

RECAPITULATION

Indian children of school age	81,620
Indian children eligible for school attendance	76,491
Government schools:	
Nonreservation boarding	9,777
Reservation boarding	11,256
Day	4,141
	25,174

INDIAN TABLE 3.—*Location, capacity, enrollment, attendance, and highest grade taught, etc., of fiscal year ended June 30, 1928*

States, agencies, and names of schools	Capacity	Enrollment	Average attendance	Highest grade taught	Class of school
Grand total.....	33, 968	34, 718	29, 564	-----	
Arizona:					
Colorado River.....	80	85	71	6	Reservation boarding.
Fort Apache Agency—					
Fort Apache.....	360	402	386	6	Do.
Canon.....	40	40	38	3	Day.
Cibecue.....	40	44	43	3	Do.
East Fork.....	110	83	1 66	6	Mission boarding and day; Lutheran.
Cibecue.....	20	17	11	4	Mission day; Lutheran.
Fort Mojave.....	250	281	250	6	Reservation boarding.
Havasupai.....	35	11	9	4	Day.
Hopi Agency—					
Hopi.....	148	173	133	5	Reservation boarding.
Chimopovy.....	50	50	44	5	Day.
Hotevilla-Bacabi.....	88	100	98	5	Do.
Oraibi.....	80	64	57	6	Do.
Polacca.....	90	76	68	6	Do.
Second Mesa.....	72	64	54	6	Do.
K a i b a b Subagency (under Paiute Agency).	22	24	15	4	Do.
Leupp Agency.....	400	420	393	6	Reservation boarding.
Phoenix.....	900	1, 029	992	12	Nonreservation boarding.
Pima Agency:					
Pima.....	230	248	238	6	Reservation boarding.
Blackwater.....	36	38	32	3	Day.
Casa Blanca.....	40	30	22	3	Do.
Chiu Chuichu.....	40	13	10	3	Do.
Co-op Village.....	25	22	18	3	Do.
Gila Crossing.....	40	27	24	3	Do.
Maricopa.....	40	30	26	3	Do.
Pima.....	20	22	19	3	Do.
Santan.....	24	24	20	3	Do.
Sacate (St. Frances Borgia)	30	18	1 13	3	Mission day; Catholic.
St. Catherine (Santa Cruz).	35	18	1 13	2	Do.
St. Johns.....	400	230	1 184	8	Mission boarding; Catholic.
St. Francis (Ak-Chin).....	24	18	1 13	3	Mission day; Catholic.
St. Michaels.....	24	20	1 14	3	Do.
St. Peter's (Casa Blanca).....	20	14	12	3	Do.
Santa Cruz.....	30	15	13	3	Do.
Stotonic.....	30	25	1 18	4	Mission day; Presbyterian.
Salt River Subagency (under Phoenix School)—					
Camp McDowell.....					Day (closed).
Lehi.....	32	25	23	3	Do.
Salt River.....	90	71	64	3	Do.
San Carlos Agency—					
Rice Station.....	216	200	179	6	Reservation boarding.
San Carlos.....	100	61	50	3	Day.
Bylas.....	80	64	48	5	Mission day; Lutheran.
Peridot.....	40	46	38	5	Mission day.
Sells Agency—					
Santa Rosa.....	40	44	14	3	Day.
San Xavier.....	120	108	97	4	Do.
Sells.....	40	20	25	4	Do.
Vamori.....	40	17	14	4	Do.
Anegam.....	60	20	1 17	3	Mission day; Catholic.
Corolie.....	36	47	1 33	(2)	Do.
Lourdes.....	36	(2)	(2)	(2)	Do.
Passinemo.....	30	19	1 13	3	Do.
San Miguel.....	45	28	1 20	3	Do.
Do.....	25	23	1 16	4	Mission day; Presbyterian.
St. Anthony's.....	120	93	1 65	5	Mission day; Catholic.
Tucson Training.....	160	51	1 36	8	Mission boarding; Presbyterian.
Southern Navajo Agency—					
Navajo.....	400	602	417	6	Reservation boarding.
Chin Lee.....	160	225	159	5	Do.
Tohatchi.....	250	253	177	6	Do.
Cornfields.....					Day (closed).
Luki Chuki.....					Do.
Ganado.....	145	1 122	1 100	(2)	Mission day; Presbyterian.
St. Michaels.....	275	1 254	1 204	(2)	Mission boarding; Catholic.
Theodore Roosevelt.....	450	467	424	7	Nonreservation boarding.
Truxton Canon.....	225	227	197	6	Reservation boarding.

¹ Estimated.² Information not available.

INDIAN TABLE 3.—*Location, capacity, enrollment, attendance, and highest grade taught, etc., of fiscal year ended June 30, 1928*—Continued

States, agencies, and names of schools	Capacity	Enrollment	Average attendance	Highest grade taught	Class of school
Arizona—Continued.					
Western Navajo Agency—					
Western Navajo.....	308	466	278	6	Reservation boarding.
Marsh Pass.....					Reservation boarding (closed).
Moencopí.....	35	38	32	3	Day.
California:					
Fort Bidwell.....	100	113	102	6	Reservation boarding.
Fort Yuma.....	200	211	192	6	Do.
Hoopa Valley.....	165	188	172	6	Do.
Mission Agency—					
Campo.....	20	17	13	5	Day.
Mesa Grande.....	30	21	17	5	Do.
Pala.....	30	18	15	5	Do.
Rincon.....	30	19	15	6	Do.
Volcan.....	30	13	10	5	Do.
St. Boniface.....	125	111	71	8	Mission boarding; Catholic.
Sacramento agency—					
Auberry.....	32	17	16	6	Day.
Burroughs.....	20	18	16	6	Do.
Pinolville.....	23	24	17	6	Do.
Tule River (Round Valley)	32	33	23	6	Do.
Sherman.....	1,000	1,239	1,048	12	Nonreservation boarding.
Colorado, Consolidated Ute Agency:					
Ute Mountain.....	150	167	152	6	Reservation boarding.
Ignacio.....	100	111	80	6	Do.
Florida Seminole.....	15	12	7	3	Day.
Idaho:					
Coeur d'Alene Agency—					
Kalispel.....	30	20	13	4	Do.
Desmet.....	89	89	80	(2)	Mission boarding; Catholic.
Kootenai.....					Closed.
Fort Hall Agency—					
Fort Hall.....	200	159	146	6	Reservation boarding.
Good Shepherd.....	24	28	28	4	Mission boarding; Catholic.
Fort Lapwai Agency—St. Josephs.	100	49	40	8	Do.
Iowa, Sac and Fox Agency:					
Fox.....	40	28	17	6	Day.
Mesquakie.....	30	26	15	6	Do.
Kansas:					
Haskell.....	850	1,007	862	12	Nonreservation boarding.
Potawatomie Subagency No. 1, Kickapoo.	30	26	23	6	
Michigan:					
Mackinac Subagency (Under Lac du Flambeau)—					
Baraga (Holy Name).....	152	55	45	6	Mission boarding and day; Catholic.
Harbor Springs (Holy Childhood).	200	167	165	(2)	Mission boarding; Catholic.
St. Joseph.....	120	(2)	(2)	(2)	Mission boarding and day; Catholic.
Mount Pleasant.....	375	483	379	9	Nonreservation boarding.
Minnesota:					
Consolidated Chippewa Agency—					
Grand Portage.....	20	30	22	6	Day.
Mille Laes.....	30	45	24	4	Do.
Nett Lake.....	60	41	30	6	Do.
Pine Point.....	53	59	33	6	Do.
St. Benedicts.....	130	138	130	(2)	Contract mission boarding; Catholic.
Pipestone.....	300	320	319	8	Nonreservation boarding.
Red Lake Agency—					
Red Lake.....	140	157	135	6	Reservation boarding.
Cross Lake.....	90	94	89	6	Do.
St. Mary's.....	180	184	155	8	Contract Mission boarding; Catholic.
Mississippi, Choctaw Agency:					
Bokhomo.....	50	13	11	4	Day.
Pearl River.....	30	46	26	6	Do.
Standing Pine.....	30	27	17	6	Do.
Tucker.....	30	43	30	6	Do.
Redwater.....	30	28	18	3	Do.

² Information not available.

INDIAN TABLE 3.—*Location, capacity, enrollment, attendance, and highest grade taught, etc., of fiscal year ended June 30, 1928—Continued*

States, agencies, and names of schools	Capacity	Enrollment	Average attendance	Highest grade taught	Class of school
Montana:					
Blackfeet Agency—					
Blackfeet.....	144	132	99	6	Reservation boarding.
Heart Butte.....	30	25	17	4	Day.
Holy Family.....	100	71	68	8	Mission boarding; Catholic.
Crow Agency—					
Big Horn.....	20	23	12	8	Mission day; Baptist.
St. Ann's.....	25	17	14	7	Mission day; Catholic.
St. Mary's.....	30	17	11	7	Do.
Sacred Heart.....	50	37	35	8	Mission; Catholic.
San Xavier.....	30	20	17	6	Do.
Flathead Agency—St. Ignatius.	235	220	200	12	Mission boarding; Catholic.
Fort Belknap Agency—					
Fort Belknap.....	112	123	109	6	Reservation boarding.
Lodge Pole.....	30	33	28	5	Day.
St. Paul's.....	120	118	108	8	Mission boarding; Catholic.
Fort Peck Agency—					
Fort Peck.....	120	147	126	6	Reservation boarding.
Latter Day Saints.....	30	3	3	(2)	Mormon mission boarding.
Wolf Point.....	50	46	39	(2)	Mission boarding and day; Presbyterian.
Rocky Boys.....	40	53	44	4	Day.
Tongue River Agency—					
Tongue River.....	80	99	79	6	Reservation boarding.
Birney.....	47	48	43	6	Day.
Lame Deer.....	40	42	24	4	Do.
St. Labre's.....	65	60	60	8	Contract mission boarding; Catholic.
Nebraska:					
Genoa.....	500	542	513	10	Nonreservation boarding.
Santee (Under Yankton Agency).....	(2)	(2)	(2)	(2)	Mission boarding and day Congregational.
Winnebago Agency—					
St. Augustine.....	(2)	47	138	6	Mission boarding; Catholic.
Winnebago Mission.....	(2)	66	64	4	Mission boarding; Dutch Reformed.
Nevada:					
Carson Agency—					
Carson.....	475	520	492	9	Nonreservation boarding.
Fort McDermitt.....	80	18	16	4	Day.
Nevada.....	70	27	20	4	Do.
Walker River Agency—					
Walker River.....	60	28	22	5	Do.
Fallon.....	40	36	29	5	Do.
Lovelocks.....	25	25	16	4	Do.
Western Shoshone—					
No. 1.....	35	32	20	5	Do.
No. 2.....	35	43	35	4	Do.
No. 3.....	35	15	12	4	Do.
New Mexico:					
Albuquerque.....	825	877	847	12	Nonreservation boarding.
Charles H. Burke.....	500	723	500	8	Do.
Eastern Navajo Agency—					
Pueblo Bonito.....	350	358	349	6	Reservation boarding.
Pinedale.....	30	22	16	3	Day.
Farmington.....	35	35	35	4	Mission boarding; Presbyterian.
Rehoboth.....	85	80	75	9	Mission board; Christian Reformed.
Lake Grove.....	20	17	16	3	Mission day.
Jicarilla Agency—Jicarilla Mission.....	70	84	79	7	Mission day; Reformed Church in America.
Mescalero.....	110	115	111	6	Reservation boarding.
Northern Navajo Agency—					
San Juan.....	400	460	417	6	Do.
Toadlena.....	160	284	208	5	Do.
Navajo Industrial.....	30	(2)	(2)	(2)	Mission boarding; Methodist.
Pueblo day schools—					
Northern at Santa Fe—					
Cochiti.....	28	35	32	4	Day.
Picuris.....	24	16	13	5	Do.
San Ildefonso.....	40	13	11	6	Do.
San Juan.....	70	61	55	4	Do.
Santa Clara.....	50	52	41	5	Do.

1 Estimated.

2 Information not available

INDIAN TABLE 3.—*Location, capacity, enrollment, attendance, and highest grade taught, etc., of fiscal year ended June 30, 1928—Continued*

States, agencies, and names of schools	Capacity	Enrollment	Average attendance	Highest grade taught	Class of school
New Mexico—Continued.					
Pueblo day schools—Contd.					
Northern at Santa Fe—Con.					
Santo Domingo.....	75	66	64	3	Day.
Taos.....	200	172	151	6	Do.
Tesuque.....	40	29	27	4	Do.
St. Catherine.....	265	248	248	9	Mission boarding; Catholic.
Southern at Albuquerque—					
Acomita.....	100	95	69	3	Day.
Encinal.....	30	24	20	4	Do.
Isleta.....	100	92	84	3	Do.
Jemez.....	75	73	56	3	Do.
Laguna.....	62	66	55	5	Do.
McCarthy's.....	33	33	32	4	Do.
Mesita.....	38	25	21	4	Do.
Paquate.....	60	54	48	5	Do.
Paraje.....	30	20	16	3	Do.
San Felipe.....	60	85	70	3	Do.
Santa Ana.....	30	30	27	3	Do.
Seama.....	28	28	22	4	Do.
Sia.....	30	31	28	2	Do.
Bernalillo.....	(²)	54	¹ 38	(²)	Mission day; Catholic.
Jemez.....	75	(²)	(²)	(²)	Do.
Santa Fe.....	450	540	490	9	Nonreservation boarding.
Zuni Agency—					
Zuni.....	80	93	64	6	Reservation boarding.
Do.....	180	149	118	3	Day.
Christian Reformed.....	90	65	55	5	Mission day; Christian Reformed.
St. Anthony's Mission.....	175	131	102	6	Mission day; Catholic.
North Carolina; Cherokee Agency:					
Cherokee.....	325	382	319	9	Reservation boarding.
Big Cove.....	40	21	15	4	Day.
Birdtown.....	40	55	30	4	Do.
North Dakota:					
Bismarck.....	125	135	127	8	Nonreservation boarding.
Fort Berthold Agency—					
No. 2 Independence.....	24	14	12	4	Day.
Shell Creek.....	28	26	19	4	Do.
Sacred Heart Mission.....	60	59	44	8	Mission boarding and day; Catholic.
Fort Berthold.....	35	32	30	4	Mission boarding; Congregational.
Fort Totten.....	250	276	261	6	Reservation boarding.
Standing Rock Agency—					
Standing Rock.....	202	260	243	6	Do.
Cannon Ball.....	40	16	13	4	Day.
Little Oak.....	30	21	15	3	Do.
St. Bernard's Mission School.....	100	64	55	8	Mission day; Catholic.
St. Elizabeth's.....	57	63	54	2	Mission boarding; Episcopal.
Turtle Mountain Agency—	30	34	18	6	Day.
No. 5.....					
Wahpeton.....	225	249	230	9	Nonreservation boarding.
Oklahoma:					
Cheyenne and Arapaho—					
Cantonment.....					Closed.
Cheyenne and Arapaho.....	224	299	234	9	Reservation boarding.
Seger.....	130	162	134	7	Do.
Chilocco.....	800	1,022	839	12	Nonreservation boarding.
Kiowa Agency—					
Anadarko.....	125	149	135	6	Reservation boarding.
Fort Sill.....	160	220	169	8	Do.
Riverside.....	160	188	152	6	Do.
Osage Agency—St. Louis'.....	75	33	22	10	Contract mission boarding; Catholic.
Pawnee Agency.....	160	163	146	6	Reservation boarding.
Quapaw Agency—					
Seneca.....	260	351	228	7	Do.
St. Mary's.....	50	51	51	6	Contract mission boarding; Catholic.
Shawnee Agency—St. Mary's Academy.....	50	51	51	12	Mission day; Catholic.
Five Civilized Tribes—					
Cherokee Nation—Sequoia Orphan Training.	300	334	297	8	Tribal boarding.
Creek Nation—					
Euclache.....	115	159	116	8	Do.
Eufaula.....	125	148	126	8	Do.

¹ Estimated.² Information not available.

INDIAN TABLE 3.—*Location, capacity, enrollment, attendance, and highest grade taught, etc., of fiscal year ended June 30, 1928—Continued*

States, agencies, and names of schools	Capacity	Enrollment	Average attendance	Highest grade taught	Class of school
Oklahoma—Continued.					
Five Civilized Tribes—Con.					
Chickasaw Nation—Bloomfield.	150	173	139	9	Tribal boarding.
Choctaw Nation—					
Jones Male Academy...	135	142	110	8	Do.
Wheelock Academy...	135	131	119	8	Do.
St. Agnes, Antlers.	60	71	63	(2)	Contract boarding; Catholic.
Choctaw and Chickasaw Nations—					
Murray State School of Agriculture.....	100	94	86	(2)	Contract boarding; State institution.
Oklahoma Presbyterian College.....	60	45	45	(2)	Contract mission boarding; Presbyterian.
Old Goodland.....	140	164	145	(2)	Contract boarding; undenominational.
St. Agnes Academy, Ardmore.	85	77	62	(2)	Contract mission boarding; Catholic.
St. Elizabeth's.....	50	35	33	(2)	Do.
St. Joseph's.....	27	23	23	(2)	Do.
Seminole Nation—Mekuskey.	100	120	72	8	Tribal boarding.
Oregon:					
Klamath Agency—					
Klamath.....					Reservation boarding (closed).
No. 3.....	20	30	25	6	Day.
Salem.....	900	1,063	908	12	Nonreservation boarding.
Umatilla Agency—St. Andrews.	150	81	71	8	Mission boarding; Catholic.
Warm Springs Agency—Warm Springs.	100	151	117	6	Reservation boarding.
South Dakota:					
Cheyenne River.....	180	164	151	6	Do.
Crow Creek Immaculate Conception.	75	55	45	7	Contract mission boarding; Catholic.
Flandreau.....	400	448	415	10	Nonreservation boarding.
Pierre.....	300	326	298	9	Do.
Pine Ridge Agency—					
Pine Ridge.....	350	419	390	8	Reservation boarding.
No. 5.....	30	31	25	3	Day.
No. 6.....	30	22	16	3	Do.
No. 7.....	33	27	17	3	Do.
No. 9.....	30	24	18	2	Do.
No. 10.....	33	20	16	5	Do.
No. 12.....	30	18	11	3	Do.
No. 15.....	24	19	15	4	Do.
No. 16.....	36	48	31	3	Do.
No. 17.....	30	33	27	3	Do.
No. 19.....	30	18	11	3	Do.
No. 20.....	24	25	19	3	Do.
No. 21.....	30	25	17	5	Do.
No. 22.....	27	25	17	3	Do.
No. 23.....	30	22	16	3	Do.
No. 24.....	33	20	16	3	Do.
No. 25.....	30	22	17	3	Do.
No. 26.....	20	19	14	3	Do.
No. 27.....	20	19	17	3	Do.
No. 28.....	23	21	14	4	Do.
No. 29.....	30	25	17	3	Do.
Holy Rosary.....	325	359	340	7	Contract mission boarding; Catholic.
Rapid City.....	325	347	312	9	Nonreservation boarding.
Rosebud Agency—					
Rosebud.....	250	293	264	7	Reservation boarding.
Blackpipe.....	25	30	26	3	Day.
Cut Meat.....	24	31	19	5	Do.
He Dog's Camp.....	27	29	25	4	Do.
Little Crow Camp.....	26	17	15	4	Do.
Milk's Camp.....	29	37	22	4	Do.
Oak Creek.....	26	22	18	5	Do.
Spring Creek.....	26	32	21	4	Do.
St. Francis.....	450	419	384	10	Contract mission boarding; Catholic.
Utah:					
Paiute Agency—					
Goshute.....	30	41	32	4	Day.
Kaibab.....	22	24	15	4	Do.
Shivwits.....	40	23	14	4	Do.

* Information not available.

INDIAN TABLE 3.—*Location, capacity, enrollment, attendance, and highest grade taught, etc., of fiscal year ended June 30, 1928—Continued*

States, agencies, and names of schools	Capacity	Enrollment	Average attendance	Highest grade taught	Class of school
Utah—Continued.					
Uintah and Ouray Agency—					
Uintah.....	110	121	102	8	Reservation boarding.
Ouray.....	18	14	12	4	Day.
Washington:					
Colville Agency—					
No. 7.....	25	13	9	5	Do.
St. Mary's.....	65	(2)	(2)	(2)	Mission boarding; Catholic.
Neah Bay Agency—					
Neah Bay.....	60	54	38	6	Day.
Quileute.....	60	14	7	6	Do.
Taholah Agency—Queets River	25	9	8	3	Do.
Tulalip Agency—					
Tulalip.....	215	284	192	9	Reservation boarding.
Jamestown.....	30	21	15	6	Day.
St. George.....	70	110	104	5	Mission boarding; Catholic.
Wisconsin:					
Hayward.....	170	154	151	6	Reservation boarding.
Keshena Agency—					
Keshena.....	140	154	145	8	Do.
Neopit.....	40	38	34	6	Day.
St. Anthony's.....	120	128	96	8	Mission day; Catholic.
St. Joseph's.....	250	255	222	8	Contract mission boarding; Catholic.
Lac du Flambeau Agency.....	130	113	91	6	Reservation boarding.
La Pointe Subagency—					
Bayfield (Holy Family).....	402	128	102	8	Mission boarding; Catholic.
Odanah (St. Mary's).....	200	54	54	10	Mission day; Catholic.
St. Mary's Mission.....	150	28	28	7	Mission boarding; Catholic.
Red Cliff.....	52	46	40	8	Mission day.
Tomah.....	325	338	315	9	Nonreservation boarding.
Wyoming, Shoshone Agency:					
Shoshone.....	135	140	123	7	Reservation boarding.
Shoshone Mission.....	20	16	15	10	Mission boarding; Episcopal.
St. Michael's.....	80	78	72	8	Contract mission boarding; Episcopal.
St. Stephen's.....	125	135	130	8	Contract mission boarding; Catholic.

GENERAL SUMMARY

Class	Number	Capacity	Enrollment	Average attendance
Government:				
Nonreservation boarding.....	19	10,025	11,675	10,310
Tribal boarding.....	7	1,060	1,207	979
Reservation boarding.....	49	9,504	11,045	9,256
Day.....	129	5,347	4,532	3,574
Total.....	204	25,936	28,459	24,119
Mission, private, or State:				
Contract boarding.....	18	2,327	2,276	2,068
Noncontract boarding.....	30	3,764	2,605	2,280
Noncontract day.....	33	1,941	1,378	1,097
Total.....	81	8,032	6,259	5,445
Total in all schools.....	285	33,968	34,718	29,564

¹ Estimated.² Information not available.

INDIAN TABLE 4.—*Vital and medical statistics of the United States Indian Service for the fiscal year 1928*

State and jurisdiction	Popula- tion as of June 30, 1928	Births and deaths (exclusive of stillbirths)					Special disease incidence							
		Number		Rate per 1,000 population		Deaths under 3 years of age	Deaths due to tuber- culosis	Tuberculosis		Trachoma				
		Births	Deaths	Excess of births over deaths	Num- ber of exam- inations			Num- ber of cases	Per- centage of positive findings	Num- ber of exam- inations	Number of cases		Per- centage of total findings	
						Posi- tive	Sus- picious				Total			
Total	1,218,744	6,115	4,761	28.0	21.8	1,354	858	30,182	4,394	14.6	9,352	2,053	11,405	19.5
Arizona:														
Camp Verde Subagency (Phoenix School)	418	3	2	7.2	4.8	1	(2)	0	0	0.0	0	0	0	0.0
Colorado River	1,139	27	34	23.7	29.9	-7	11	140	24	17.1	581	48	121	20.8
Fort Apache	2,656	92	70	34.6	26.4	22	10	1,662	58	3.3	1,710	613	613	35.8
Fort Mojave School								(4)		(2)	(4)	44	0	44
Havasupai	194	4	3	20.6	15.5	1	2	0	0	0	84	22	10	32
Hopi	3,524	91	112	17.4	21.4	-21	41	38	15	3.9	743	118	0	118
Kaibab Subagency (Paute)	94	3	4	31.9	42.6	-1	3	0	42	0	35	6	2	8
Leupp	1,651	8	24	4.8	14.5	-16	7	6	20	65.0	422	79	18	22.9
Phoenix School									13	1.3	1,029	87	18	23.0
Pima	5,535	71	82	12.8	14.8	-11	16	1,716	89	5.2	1,766	93	37	8.5
Salt River Subagency (Phoenix School)	1,311	42	24	32.0	18.3	18	9	154	22	14.3	172	103	28	76.2
San Carlos	2,545	101	87	39.7	34.2	14	40	370	25	6.8	379	65	41	28.0
Sells	5,209	112	100	21.5	19.2	12	39	528	394	74.6	1,562	195	33	106
Southern Navajo	12,602	600	350	47.6	27.8	250	(2)	(4)	227	(2)	5,210	2,338	48	2,386
Truxton Canon		4	12	(2)	(2)	-8	7	0	0	0	215	54	0	54
Western Navajo	3,789	157	137	19.9	17.4	20	9	546	58	10.6	1,833	283	171	24.8
California:														
Bishop Subagency (Walker River)	1,370	14	13	10.2	9.5	1	1	0	0	0	0	0	0	0
Fort Bidwell	629	13	17	20.7	27.0	-4	4	5	2	7	1,062	64	4	68
Fort Yuma	867	19	21	21.9	24.2	-2	3	5	4	80.0	114	1	0	1
Mission	2,763	54	52	19.5	18.8	2	6	1,234	30	2.4	1,506	16	87	6.8
Sacramento	11,334	222	224	19.5	19.7	-2	49	52	17	32.7	356	92	43	135
Sherman Institute								973	1	1	973	206	0	206
Colorado: Consolidated Ute	857	33	23	38.5	26.8	10	6	124	4	3.2	247	69	0	69
Florida: Seminole	506	6	10	11.9	19.8	-4	1	1	1	100.0	0	0	0	0
Idaho:														
Coeur d'Alene	592	17	16	28.7	27.0	1	7	23	17	73.9	183	92	50	142
Fort Hall	1,770	51	58	28.8	32.8	-7	15	100	38	38.0	1,334	259	0	259
Fort Lapwai	1,387	34	42	24.5	30.3	-8	7	121	23	19.0	311	32	0	32

1 Not total population, but only that for which medical statistics are available.

2 No data available.

3 Estimate.

INDIAN TABLE 4.—Vital and medical statistics of the United States Indian Service for the fiscal year 1928—Continued

State and jurisdiction		Births and deaths (exclusive of stillbirths)					Special disease incidence									
		Number		Rate per 1,000 population		Excess of births over deaths	Deaths under 3 years of age	Deaths due to tuberculosis	Tuberculosis		Trachoma			Per-centage of total findings		
									Births	Deaths	Num-ber of exami-nations	Per-centage of positive findings	Num-ber of exami-nations		Number of cases	
															Posi-tive	Sus-picious	Total
Iowa: Sac and Fox.	397	23	17	57.9	42.8	6	7	6	15	11	73.3	113	17	5	22	19.5
Kansas: Potawatomi Subagency (Haskell Institute)	1,541	14	13	9.1	8.4	1	0	3	(2)	(2)	(2)	(2)	2	0	2	100.0
Michigan: Mackinac Subagency (Lac du Flambeau)	1,190	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Minnesota:																
Consolidated Chippewa.	12,996	505	268	38.9	20.7	237	24	60	2,137	222	10.4	3,298	121	31	152	4.6
Pipestone School.	554	2	5	3.6	9.0	-3	0	2	1	1	100.0	320	26	12	38	11.9
Red Lake.	1,766	88	71	49.8	40.2	17	23	16	47	47	100.0	17	6	0	6	35.3
Mississippi: Choctaw.	1,496	41	10	27.4	6.7	31	3	2	176	17	9.7	216	3	0	3	1.4
Montana:																
Blackfeet.	3,469	138	58	39.7	16.7	80	22	13	943	485	51.4	(2)	(2)	(2)	(2)	(2)
Crow.	1,892	82	44	43.3	23.3	38	16	8	181	25	13.8	221	78	22	100	45.2
Flathead.	2,784	48	37	17.2	13.3	11	8	5	100	10	10.0	(2)	(2)	(2)	(2)	(2)
Fort Belknap.	1,215	56	39	46.1	32.1	17	11	15	776	81	10.4	904	151	55	206	22.8
Fort Peck.	2,399	101	47	42.1	19.6	54	11	25	1,290	167	12.9	908	103	15	118	13.0
Rocky Boy's.	531	24	14	45.2	26.4	10	8	3	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Tongue River.	1,444	52	58	36.0	40.2	-6	25	22	35	30	85.7	720	378	38	416	57.8
Nebraska:																
Genoa School.	381	(2)	(2)	(2)	(2)	(2)	(2)	(2)	12	6	50.0	522	28	53	81	15.5
Ponca Subagency (Yankton).	2,671	87	72	32.6	27.0	15	26	8	(2)	(2)	38.2	(2)	(2)	(2)	(2)	(2)
Winnebago.									110	42		95	22	15	37	38.9
Nevada:																
Carson.	2,671	30	28	11.2	10.5	2	6	5	0	0	0	(2)	(2)	(2)	(2)	(2)
Moapa River Subagency (Paiute).	196	9	11	45.9	56.1	-2	2	4	25	(2)	47.8	57	25	5	30	52.6
Walker River.	1,363	17	33	12.5	24.2	-16	1	8	92	44	(2)	228	3	0	3	1.3
Western Shoshone.	690	14	25	20.3	36.2	-11	5	12	(2)	(2)	(2)	213	50	(2)	50	23.5
New Mexico:																
Albuquerque School.									856	0	0	856	46	0	46	5.4
Charles H. Burke School.	3,709	28	40	7.5	10.8	-12	15	2	20	5	25.0	535	150	50	200	37.4
Eastern Navajo.	636	32	22	50.3	34.6	10	11	3	80	12	15.0	476	44	(2)	44	9.2
Jicarilla.	675	31	22	45.9	32.6	9	8	5	93	(2)	9.1	121	8	4	12	9.9
Mescalero.	775	32	22	45.9	32.6	9	8	5	242	22	100.0	532	28	0	28	5.3
Northern Navajo.	7,000	245	75	38.6	35.0	25	30	1	11	11	9.4	451	164	0	164	36.4
Northern Pueblos.	3,188	140	75	44.3	23.7	65	3	5	392	37	9.4	237	62	43	105	44.3

Santa Fe School.....	6, 130	220	161	35.9	26.3	59	95	(2)	3	6	540	71	0	71	13.1
Southern Pueblos.....	1, 088	64	51	58.8	46.9	13	21	(2)	28	6.4	438	25	4	27	6.2
Zuni.....	5, 503	(2)	(2)	(2)	(2)	(2)	(2)	(2)	302	1, 675	515	13	(2)	17	1.0
New York: New York.....	2, 951	37	28	12.5	9.5	(2)	8	(2)	4	1.1	380	31	43	74	19.5
North Carolina: Cherokee.....															
North Dakota:															
Bismarck School.....	1, 373	67	47	48.8	34.2	20	15		4	2.9	136	8	22	30	22.1
Fort Berthold.....	3, 935	43	41	46.0	43.8	2	10	(2)	13	6.3	1, 330	108	(2)	168	12.6
Fort Totten.....	3, 666	135	108	36.8	29.5	27	(2)	(2)	26	(2)	1, 191	165	165	105	86.4
Standing Rock.....	4, 416	47	31	10.6	7.0	16	6	(2)	134	11.7	1, 479	236	157	393	26.6
Turtle Mountain.....									24	32.4	770	88	12	100	13.0
Wahpeton School.....									7	3.0	231	29	3	32	13.8
Wahpeton School.....															
Oklaoma:															
Bloomfield Seminary.....	2, 680	72	77	26.9	28.7	-5	20		(2)	(2)	(2)	(2)	(2)	(2)	(2)
Cheyenne and Arapahoe.....									99	9.9	947	150	162	312	32.9
Chilocco School.....									10	25.6	1, 022	80	184	264	25.8
Eufaula Boarding School.....									0	0	159	12	38	50	31.4
Eufaula Boarding School.....									0	0	148	5	0	5	3.4
Jones Academy.....	5, 290	131	75	24.8	14.2	56	35		0	0	144	4	2	6	4.2
Kiowa.....	2, 882	53	27	18.4	9.4	26	3		85	21.3	400	62	0	62	15.5
Osage.....	2, 766	87	63	31.5	22.8	24	16		27	30.0	107	21	19	40	37.4
Pawnee.....	1, 931	16	13	8.3	6.7	3	0		13	38.2	116	50	12	62	53.4
Quapaw.....									0	0	0	0	0	0	0
Sequoyah Training School.....	2, 280	18	14	7.9	6.1	4	3		7	3.2	(2)	221	1	222	(2)
Shawnee.....									8	23.6	49	28	15	43	87.8
Wheeler Academy.....									1	1.1	91	0	0	0	0
Oregon:															
Klamath.....	1, 274	35	31	27.5	24.3	4	6		17	(2)	223	60	(2)	60	26.9
Salem School.....									(2)	(2)	834	28	(2)	28	3.4
Siletz Subagency (Salem School).....	1, 138	34	7	29.9	6.1	27	0		0	0	0	0	0	0	0
Umatilla.....	1, 107	11	13	9.9	11.7	-2	2		15	02.5	18	(2)	(2)	(2)	(2)
Warm Springs.....	1, 012	11	13	10.9	12.8	-2	9		21	7.7	235	15	3	18	7.7
South Dakota:															
Canton Insane Asylum.....															
Cheyenne River.....	3, 040	95	70	31.2	23.0	25	10		11	11.7	94	9	0	9	9.6
Crow Creek.....	1, 513	22	34	14.5	22.5	-12	4		279	20.3	1, 003	95	61	156	15.6
Flandreau School.....	312	5	9	16.0	23.8	-4	(2)		34	14.3	421	33	30	63	15.0
Pierre School.....									0	0	0	0	0	0	0
Pine Ridge.....	7, 833	395	235	50.4	30.0	160	63		(2)	(2)	295	20	19	39	13.2
Rapid City School.....									250	16.1	3, 875	113	20	133	3.4
Rosebud.....	5, 975	228	139	38.2	23.3	89	40		5	13.5	325	50	(2)	30	15.3
Sisseton.....	2, 569	62	69	24.1	26.9	-7	13		331	16.4	3, 196	331	0	331	16.4
Sisseton.....	2, 004	33	86	16.5	42.9	-53	11		41	46.1	203	21	0	21	12.0
Yankton.....									(2)	(2)	(2)	(2)	(2)	(2)	(2)
Utah:															
Paute.....	598	25	29	41.8	43.5	-4	9		2	2.0	124	44	5	49	39.5
Uintah and Ouray.....	1, 172	53	59	45.2	50.3	-6	14		4	80.0	1, 017	250	11	201	25.7
Washington:															
Colville.....	2, 949	21	13	7.1	4.4	8	(2)		(2)	(2)	(2)	(2)	(2)	(2)	(2)
Neah Bay.....	1, 326	22	16	16.6	12.1	6	3		26	12.4	215	0	15	15	7.0
Taholah.....	1, 387	45	40	32.4	23.8	5	12		4	5.9	68	0	0	0	0

* Estimate.

* No data available.

INDIAN TABLE 4.—*Vital and medical statistics of the United States Indian Service for the fiscal year 1928.*—Continued.

State and jurisdiction	Popula- tion as of June 30, 1928	Births and deaths (exclusive of stillbirths)					Tuberculosis				Trachoma						
		Number		Rate per 1,000 population		Excess of births over deaths	Deaths under 3 years of age	Deaths due to tuber- culosis	Num- ber of exami- nations	Num- ber of cases	Per- centage of positive findings	Number of cases			Per- centage of total findings		
												Births	Deaths	Births		Deaths	Total
Tulalip.....	3,409	51	68	15.0	20.0	-17	15	12	259	78	29.3	331	57	0	57	17.2	
Yakima.....	2,974	91	81	30.6	27.2	10	14	13	0	0	0	0	0	0	0	0	0
Wisconsin:																	
Hayward School.....	1,377	33	22	24.0	16.0	11	6	3	131	15	11.4	772	7	0	7	9	9
Keshena.....	1,940	64	65	33.0	33.5	-1	17	18	90	36	40.0	840	26	0	26	3.1	3.1
Lac du Flambeau.....	3,157	61	52	19.3	16.5	9	7	14	250	16	6.4	255	26	0	26	10.2	10.2
Tomah School.....										(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Grand Rapids Subagency (Tomah School).....	1,371	32	29	23.3	21.2	3	5	16	200	26	13.0	220	25	35	60	27.3	27.3
Wyoming: Shoshone.....	(2)	86	74	(2)	(2)	12	19	6	(2)	(2)	(2)	599	343	20	363	60.6	60.6

2 No data available.

NOTE.—The above table of vital and medical statistics is published with the following reservations:

a The figures are as accurate as possible under existing field conditions. Many factors operate to make them estimates.

b Birth and death rates for a given agency are often not inclusive, but are only for those cases with which the Government officials have come in contact.

c Percentages for tuberculosis and trachoma are high in many instances, due to the fact that only suspicious cases were examined.

BUREAU OF PENSIONS

PENSIONS TABLE 1.—*Number of claims received and disposed of in the fiscal year 1928 and the number pending June 30, 1928*

Classes	Pending June 30, 1927	Received during year	Disposed of during year	Pending June 30, 1928
Civil War:				
Soldiers.....	6, 268	9, 729	15, 599	398
Widows, etc.....	4, 039	7, 462	8, 755	2, 746
Total.....	10, 307	17, 191	24, 354	3, 144
War with Spain:				
Soldiers.....	41, 665	65, 868	84, 295	23, 238
Widows, etc.....	3, 480	5, 164	5, 529	3, 115
Total.....	45, 145	71, 032	89, 824	26, 353
Regular Establishment:				
Soldiers.....	5, 608	7, 814	8, 141	5, 281
Widows, etc.....	859	1, 279	1, 531	607
Total.....	6, 467	9, 093	9, 672	5, 888
Indian wars:				
Soldiers.....	2, 872	4, 004	5, 878	998
Widows, etc.....	1, 006	1, 532	1, 862	676
Total.....	3, 878	5, 536	7, 740	1, 674
Old wars.....	14	10	24	-----
Navy service.....	10	56	58	8
Special acts.....	17	2, 725	1, 726	1, 016
Total.....	41	2, 791	1, 808	1, 024
Total, all classes.....	65, 838	105, 643	133, 398	38, 083
Accrued.....	4, 697	7, 998	9, 543	3, 152
Reimbursement.....	863	4, 423	4, 240	1, 046
Half pension.....	290	457	439	308
Grand total.....	71, 688	118, 521	147, 620	42, 589

PENSIONS TABLE 2.—*Statement showing loss to roll by death, from July 1, 1927, to June 30, 1928, inclusive*

Month	Soldiers		Widows, etc.		Total
	Civil War	Other classes	Civil War	Other classes	
1927					
July.....	1, 246	378	1, 622	84	3, 330
August.....	1, 086	270	1, 474	79	2, 909
September.....	941	178	1, 649	18	2, 786
October.....	1, 146	325	1, 444	81	2, 996
November.....	1, 131	373	1, 517	103	3, 124
December.....	1, 044	341	1, 538	100	3, 023
1928					
January.....	1, 475	370	2, 000	98	3, 943
February.....	1, 398	392	2, 000	79	3, 869
March.....	1, 284	422	1, 857	113	3, 676
April.....	1, 700	422	2, 109	90	4, 321
May.....	1, 470	349	1, 989	86	3, 894
June.....	1, 316	352	1, 837	86	3, 591
Total.....	15, 237	4, 172	21, 036	1, 017	41, 462

PENSIONS TABLE 3.—*Appropriations for pensions, and disbursements therefrom, for the fiscal year ended June 30, 1928, and unexpended balance at close of year*

	Army	Navy	Total
Appropriations:			
Act Jan. 12, 1927.....	\$175,800,000.75	\$7,200,000.75	\$183,000,001.50
Act Dec. 22, 1927.....	42,800,000.00	3,200,000.00	46,000,000.00
Repayment to appropriation.....	211,928.86	18,195.48	230,124.34
Total to be accounted for.....	218,811,929.61	10,418,196.23	229,230,125.84
Disbursements:			
By disbursing clerk, Bureau of Pensions.....	218,547,476.26	10,418,196.23	228,965,672.49
Balance June 30, 1928.....	264,453.35	-----	264,453.35

PENSIONS TABLE 4.—*Amount paid to pensioners, 1790 to end of fiscal year 1928*

War of the Revolution.....	\$70,000,000.00	Regular establishment.....	\$82,477,285.87
War of 1812.....	46,181,424.39	World War.....	236,226.75
Indian Wars.....	35,470,838.42	Unclassified.....	16,513,425.54
War with Mexico.....	58,600,427.15		
Civil War.....	7,101,082,788.89	Total.....	7,720,464,743.81
War with Spain.....	309,902,326.80		

PENSIONS TABLE 5.—*Statement showing, by classes, the different monthly rates paid to pensioners under special acts of Congress, and the number at each rate on the roll June 30, 1928*

Rate	Regular establishment		Civil War			War with Spain			War of 1812, wid-ows	War with Mex-ico, wid-ows	Indian wars		World War sol-diers
	Sol-diers	Wid-ows, etc.	Sol-diers	Nurses	Wid-ows, etc.	Sol-diers	Nurses	Wid-ows, etc.			Sol-diers	Wid-ows, etc.	
\$6.....	19					5					6		
\$8.....	20	1	1			1					3		
\$10.....	14				4	2							
\$12.....	339	157	2		308	88	2	33		4	15	30	
\$14.....	7				1						1		
\$15.....	4	4			19	13		1			1		
\$16.....	2					1					1		
\$17.....	123	2				15							
\$18.....	11	1			13	12							
\$20.....	44	109	2		1,108	74	2	119	1	10	56	16	
\$22.....		1				1							
\$24.....	94	1	2		2	18					1		
\$25.....		42	1		108	7		9					
\$27.....	1												
\$30.....	83	51	18		2,690	55		31		19	15	38	1
\$35.....		24	1		35			7					
\$36.....	3					2							
\$38.....					1								
\$40.....	27	48	1		402	5		10		2	6	2	
\$42.....					54								
\$45.....		1			25								
\$50.....	19	51	275	8	2,698	28		19		11	84		
\$54.....					1								
\$55.....	1					2							
\$60.....	2	1			4	2							
\$62.....					1								
\$65.....	1				2	1							
\$70.....					3								
\$72.....	4		2			7				1			
\$75.....		1			5			2					
\$80.....			1			2							
\$85.....						1							
\$90.....	2					1							
\$100.....	1	10			3								
\$125.....		1											
\$150.....		4						1					
\$208.33 1/3.....		1											
\$416.66 2/3.....								1					
Total.....	821	511	306	8	7,487	343	4	233	1	47	188	86	1

PENSIONS TABLE 6.—*Disbursements for pensions and for maintenance of pension system 1866 to 1928*

Fiscal year	Paid as pensions	Cost, maintenance, and expenses ¹	Total	Number of pensioners
1866	\$15,450,549.88	\$407,165.00	\$15,857,714.88	126,722
1867	20,784,789.69	490,977.35	21,275,767.04	155,474
1868	23,101,509.36	553,020.34	23,654,529.70	169,643
1869	28,513,247.27	564,526.81	29,077,774.08	187,963
1870	29,351,488.78	600,997.86	29,952,486.64	198,686
1871	28,518,792.62	863,079.00	29,381,871.62	207,495
1872	29,752,746.81	951,253.00	30,703,999.81	232,229
1873	26,982,063.89	1,003,200.64	27,985,264.53	238,411
1874	30,206,778.99	966,794.13	31,173,573.12	236,241
1875	29,270,404.76	982,695.35	30,253,100.11	234,821
1876	27,936,209.53	1,015,078.81	28,951,288.34	232,137
1877	28,182,821.72	1,034,459.33	29,217,281.05	232,104
1878	26,786,609.44	1,032,500.09	27,818,509.53	223,998
1879	33,664,428.92	837,734.14	34,502,163.06	242,755
1880	56,689,229.08	935,027.28	57,624,256.36	250,802
1881	50,583,405.35	1,072,059.64	51,655,464.99	268,830
1882	54,313,172.05	1,466,236.01	55,779,408.06	285,697
1883	60,427,573.81	2,591,648.29	63,019,222.10	303,658
1884	57,912,387.47	2,835,181.00	60,747,568.47	322,756
1885	65,171,937.12	3,392,576.34	68,564,513.46	345,125
1886	64,091,142.90	3,245,016.61	67,336,159.51	363,787
1887	73,752,997.08	3,753,400.91	77,506,397.99	406,007
1888	78,950,501.67	3,515,057.27	82,465,558.94	432,553
1889	88,842,720.58	3,466,968.40	92,309,688.98	489,725
1890	106,093,850.39	3,526,382.13	109,620,232.52	537,944
1891	117,312,690.50	4,700,636.44	122,013,326.94	676,160
1892	139,394,147.11	4,898,665.80	144,292,812.91	876,068
1893	156,906,637.94	4,867,734.42	161,774,372.36	966,012
1894	139,986,726.17	3,963,976.31	143,950,702.48	969,544
1895	139,812,294.30	4,338,020.21	144,150,314.51	970,524
1896	138,220,704.46	3,991,375.61	142,212,080.07	970,678
1897	139,949,717.35	3,987,783.07	143,937,500.42	976,014
1898	144,651,879.80	4,114,091.46	148,765,971.26	993,714
1899	138,355,052.95	4,147,517.73	142,502,570.68	991,519
1900	138,462,130.65	3,841,706.74	142,303,837.39	993,592
1901	138,531,483.84	3,868,795.44	142,400,279.28	997,735
1902	137,504,267.99	3,831,378.96	141,335,646.95	999,446
1903	137,759,653.71	3,993,216.79	141,752,870.50	996,545
1904	141,093,571.49	3,849,366.25	144,942,937.74	994,762
1905	141,142,861.33	3,721,832.82	144,864,694.15	998,441
1906	139,000,288.25	3,523,269.51	142,523,557.76	985,971
1907	138,155,412.46	3,309,110.44	141,464,522.90	967,371
1908	153,093,086.27	2,800,963.36	155,894,049.63	951,687
1909	161,973,703.77	2,852,583.73	164,826,287.50	946,194
1910	159,974,056.08	2,657,673.86	162,631,729.94	921,083
1911	157,325,160.35	2,517,127.06	159,842,287.41	892,098
1912	152,986,433.72	2,448,857.31	155,435,291.03	860,294
1913	174,171,660.80	2,543,246.59	176,714,907.39	820,200
1914	172,417,546.26	2,066,507.15	174,484,053.41	785,239
1915	165,518,266.14	1,779,860.30	167,298,126.44	748,147
1916	159,155,089.92	1,656,722.33	160,811,812.25	709,572
1917	160,895,053.94	1,562,854.96	162,457,908.90	673,111
1918	179,835,328.75	1,527,615.61	181,362,944.36	646,895
1919	222,159,292.70	1,433,191.67	223,592,484.37	624,427
1920	213,295,314.65	1,395,014.09	214,690,328.74	592,190
1921	258,720,820.67	1,389,921.55	260,110,742.22	566,053
1922	253,807,583.37	1,394,079.47	255,201,662.84	547,016
1923	253,012,500.18	1,992,062.97	255,004,563.15	539,756
1924	229,994,777.60	1,497,698.53	231,492,476.13	525,539
1925	217,150,612.00	1,489,087.39	218,639,699.39	512,537
1926	207,844,348.29	1,436,001.05	209,280,349.34	501,723
1927	230,152,712.17	1,327,252.47	231,479,964.64	489,942
1928	228,965,672.49	1,214,565.95	230,180,238.44	491,194

¹ Expenses of medical examinations and special field examinations not included.

PENSIONS TABLE 7.—*Pensioners on the roll June 30, 1928, and the annual value thereof, arranged by States, Territories, and possessions, and by foreign countries*

States, Territories, and District of Columbia	Number	Amount	States, Territories, and District of Columbia	Number	Amount
Alabama.....	2,315	\$918,516.00	North Dakota.....	1,070	\$462,346.00
Alaska.....	56	18,354.00	Ohio.....	43,740	20,633,157.00
Arizona.....	948	356,038.00	Oklahoma.....	7,206	3,360,276.00
Arkansas.....	5,222	2,407,546.00	Oregon.....	5,666	2,433,355.00
California.....	33,104	13,440,799.00	Pennsylvania.....	40,267	17,907,011.00
Colorado.....	5,432	2,406,457.00	Rhode Island.....	2,539	1,120,439.00
Connecticut.....	5,153	2,330,636.00	South Carolina.....	1,437	494,449.00
Delaware.....	1,063	508,603.00	South Dakota.....	2,487	1,140,250.00
District of Columbia.....	6,111	2,138,728.00	Tennessee.....	9,123	4,014,327.00
Florida.....	4,334	2,059,059.00	Texas.....	6,799	2,634,273.00
Georgia.....	3,270	911,590.00	Utah.....	1,503	452,049.00
Idaho.....	1,649	712,935.00	Vermont.....	3,111	1,497,695.00
Illinois.....	33,096	15,536,116.00	Virginia.....	5,590	2,084,976.00
Indiana.....	27,897	13,473,408.00	Washington.....	7,615	3,339,617.00
Iowa.....	15,624	7,734,658.00	West Virginia.....	5,615	2,565,137.00
Kansas.....	17,736	8,924,659.00	Wisconsin.....	12,333	5,893,296.00
Kentucky.....	12,950	5,706,759.00	Wyoming.....	794	300,988.00
Louisiana.....	3,206	1,346,520.00	Total.....	484,331	219,227,848.52
Maine.....	6,641	3,184,070.00	Canal Zone.....	24	6,256.00
Maryland.....	5,589	2,459,778.00	INSULAR POSSESSIONS		
Massachusetts.....	17,879	7,922,516.00	Guam.....	4	1,440.00
Michigan.....	19,233	8,969,757.00	Hawaii.....	100	54,420.00
Minnesota.....	7,953	3,633,751.00	Philippine Islands.....	3,486	793,308.00
Mississippi.....	2,151	1,068,429.00	Porto Rico.....	230	56,620.00
Missouri.....	22,899	10,971,471.52	Samoa.....	4	1,860.00
Montana.....	1,987	790,955.00	Virgin Islands.....	1	720.00
Nebraska.....	7,216	3,454,972.00	Total.....	3,825	908,368.00
Nevada.....	274	99,917.00			
New Hampshire.....	3,131	1,468,418.00			
New Jersey.....	10,808	4,722,039.00			
New Mexico.....	1,038	423,232.00			
New York.....	38,600	17,732,166.00			
North Carolina.....	2,871	1,061,355.00			

Foreign countries	Number	Amount	Foreign countries	Number	Amount
Australia.....	48	\$20,825.00	Italy.....	64	\$17,560.00
Canada.....	1,527	756,060.00	Mexico.....	53	17,310.00
China.....	37	13,630.00	Norway.....	59	18,590.00
Cuba.....	77	18,620.00	Scotland.....	27	14,502.00
Denmark.....	30	11,853.00	Sweden.....	49	18,100.00
England.....	209	92,970.00	Switzerland.....	35	13,150.00
France.....	78	30,340.00	Other foreign countries.....	268	98,778.00
Germany.....	185	70,085.00	Total.....	3,014	1,306,025.00
Ireland.....	235	80,982.00			
Japan.....	33	12,670.00			

PENSIONS TABLE 8.—*Comparative table of disbursements of pensions on account of the different wars, for the last five fiscal years*

	1928	1927	1926	1925	1924
Civil War.....	\$149,668,976.19	\$166,493,208.58	\$171,605,623.27	\$186,208,394.36	\$202,999,955.16
War with Spain.....	70,674,419.27	57,232,828.30	30,223,218.67	25,098,500.89	21,139,863.45
War of 1812.....	8,903.34	9,805.66	7,400.00	9,392.00	13,383.00
War with Mexico.....	544,406.46	568,966.23	434,792.69	506,897.45	580,601.02
Indian wars.....	3,956,943.80	2,013,766.42	1,900,185.94	1,959,110.03	1,919,223.65
Regular establishment.....	4,095,763.23	3,818,070.22	3,655,799.32	3,350,284.66	3,321,179.22
World War.....	16,260.20	16,066.76	17,328.40	18,032.60	20,572.10
Total.....	228,965,672.49	230,152,712.17	207,844,348.29	217,150,612.00	229,994,777.60

PENSIONS TABLE 9.—*Pension certificates issued during the year ended June 30, 1928*

Classes	Original	Increase	Reissue	Restoration	Renewal	Supplemental	Total
Civil War:							
Soldiers and sailors—							
General law	95	18	2		8		123
Act of June 27, 1890	2						2
Act of Feb. 6, 1907	2						2
Act of May 11, 1912	3	6					9
Act of May 1, 1920	64	1,765	44		2	1	1,876
Act of July 3, 1926		3,479	82				3,561
Widows, etc.—							
General law	727	87	439		29		1,282
Act of June 27, 1890	39		1	2		4	46
Act of Apr. 19, 1908	11			1			12
Act of Apr. 19, 1908, amended by							
Act of Sept. 8, 1916	47	1	1				49
Act of May 1, 1920	4,984	2	11	3	3		5,003
Act of July 3, 1926	204	4	75				283
Remarried widows—							
Act of Sept. 8, 1916	3				10		13
Act of May 1, 1920	222			1	461		684
Act of July 3, 1926	43		35		96		174
War with Spain:							
Soldiers, sailors, and nurses—							
General law	56	21	2	1	5	16	101
Act of June 5, 1920	1,033	56	78	3	7		1,177
Act of May 1, 1926	27,759	29,012	1,711	2	215		58,699
Widows, etc.—							
General law	71	4	7		3	1	86
Act of July 16, 1918	53		4			1	58
Act of Sept. 1, 1922	203		4	2			209
Act of May 1, 1926	3,141	2	52	1	8	2	3,206
Remarried widow—							
Act of Sept. 1, 1922	15						15
Act of May 1, 1926	126		1		70		197
Regular Establishment (general law):							
Soldiers and sailors	1,748	865	68	16	26	6	2,729
Widows, etc.	450	69	6		1		526
World War (general law):							
Soldiers and sailors		2					2
War with Mexico:							
Survivors—Act of May 1, 1920		1					1
Widows—Act of Jan. 29, 1887	8	2	6				16
Indian Wars:							
Survivors—							
Act of Mar. 4, 1917	98	3	13				114
Act of Mar. 3, 1927	1,434	545	1,013		8		3,000
Widows—							
Act of July 27, 1892	3						3
Act of Mar. 4, 1917	109		1		1		111
Act of Mar. 3, 1927	571	12	100		18		701
Total	43,324	35,956	3,756	32	971	31	84,070
Accrued pension orders							7,777
Reissues in lieu of lost pension certificates							944
Grand total							92,791

Pension certificates issued for reimbursement, 184.

PENSIONS TABLE 10.—*Total number of certificates issued on account of all claims allowed since the establishment of the pension system (to include June 30, 1928)*

Original soldiers' and sailors' claims allowed:	
Revolutionary War (approximated).....	52,504
War of 1812.....	25,723
Mexican War.....	20,668
Indian wars.....	14,714
Old wars, prior to March 4, 1861.....	9,486
Since March 4, 1861, exclusive of war with Spain.....	1,189,076
War with Spain (all laws).....	184,966
Total.....	1,497,137
Reissue and increase claims allowed:	
Revolutionary War (approximated).....	2,992
Mexican War (approximated).....	20,771
Indian wars (approximated).....	5,684
Since March 4, 1861, exclusive of war with Spain.....	3,955,122
War with Spain (all laws).....	129,544
Total.....	4,114,113
Total soldiers' and sailors' claims allowed.....	5,611,250
Original widows' claims allowed:	
Revolutionary War (approximated).....	22,644
Revolutionary daughters (special acts).....	18
War of 1812.....	35,522
Mexican War.....	16,384
Indian wars.....	12,488
Old wars, prior to March 4, 1861.....	8,046
Since March 4, 1861, exclusive of war with Spain.....	979,778
War with Spain (all laws).....	37,263
Total.....	1,112,143
Reissue and increase claims allowed:	
War with Spain (all laws).....	3,015
All other wars (approximated).....	106,088
Total.....	109,103
Total widows' claims allowed.....	1,221,246
Approximated number of issues on account of all claims allowed:	
Soldiers and sailors.....	5,611,250
Widows.....	1,221,246
Total.....	6,832,496

PENSIONS TABLE 11.—*Number of pensions granted by special acts each Congress since March 4, 1861*

Thirty-seventh (1861-1863).....	12	Fifty-fifth (1897-1899).....	694
Thirty-eighth (1863-1865).....	27	Fifty-sixth (1899-1901).....	1,391
Thirty-ninth (1865-1867).....	138	Fifty-seventh (1901-1903).....	2,171
Fortieth (1867-1869).....	275	Fifty-eighth (1903-1905).....	3,355
Forty-first (1869-1871).....	85	Fifty-ninth (1905-1907).....	6,030
Forty-second (1871-1873).....	167	Sixtieth (1907-1909).....	6,600
Forty-third (1873-1875).....	182	Sixty-first (1909-1911).....	9,649
Forty-fourth (1875-1877).....	98	Sixty-second (1911-1913).....	6,350
Forty-fifth (1877-1879).....	230	Sixty-third (1913-1915).....	5,061
Forty-sixth (1879-1881).....	96	Sixty-fourth (1915-1917).....	5,885
Forty-seventh (1881-1883).....	216	Sixty-fifth (1917-1919).....	3,641
Forty-eighth (1883-1885).....	598	Sixty-sixth (1919-1921).....	2,200
Forty-ninth (1885-1887).....	856	Sixty-seventh (1921-1923).....	2,319
Fiftieth (1887-1889).....	1,015	Sixty-eighth (1923-1925).....	2,436
Fifty-first (1889-1891).....	1,388	Sixty-ninth (1925-1927).....	5,375
Fifty-second (1891-1893).....	217	Seventieth (1st sess., 1927-28).....	3,596
Fifty-third (1893-1895).....	119		
Fifty-fourth (1895-1897).....	378	Total.....	72,850

PENSIONS TABLE 12.—*Pensioners on the roll June 30, 1928 and June 30, 1927*

Classes	1928	1927	Gain	Loss
Regular Establishment:				
Invalids.....	13,665	13,085	580	-----
Widows.....	1,937	1,886	51	-----
Minor children.....	157	158	-----	1
Mothers.....	1,238	1,194	44	-----
Fathers.....	206	199	7	-----
Brothers, sisters, sons, and daughters.....	12	13	-----	1
Helpless children.....	5	5	-----	-----
Civil War:				
General laws—				
Invalids.....	925	963	-----	38
Widows.....	6,735	6,552	183	-----
Minor children.....	16	13	3	-----
Mothers.....	2	5	-----	3
Brothers, sisters, sons, and daughters.....	1,340	1,297	43	-----
Helpless children.....	7	8	-----	1
Act of May 1, 1920—				
Survivors.....	35,917	43,998	-----	8,081
Widows.....	133,802	183,450	-----	49,648
Minor children.....	653	727	-----	74
Helpless children.....	842	858	-----	16
Act of July 3, 1926—				
Invalids.....	38,087	45,039	-----	6,952
Widows.....	16,431	19,732	-----	3,301
Act of May 23, 1928—Widows.....	38,106	-----	38,106	-----
Act of Aug. 5, 1892—Nurses.....	43	49	-----	6
War with Spain:				
General laws—				
Invalids.....	1,821	2,996	-----	1,175
Nurses.....	4	5	-----	1
Widows.....	169	163	6	-----
Minor children.....	8	9	-----	1
Mothers.....	1,218	1,302	-----	84
Fathers.....	188	193	-----	5
Brothers, sisters, sons, and daughters.....	4	5	-----	1
Act of May 1, 1926—				
Invalids.....	162,887	135,816	27,071	-----
Nurses.....	363	274	89	-----
Widows.....	23,068	20,437	2,631	-----
Minor children.....	1,502	1,410	92	-----
Helpless children.....	38	28	10	-----
War of 1812: Widows.....	14	17	-----	3
War with Mexico:				
Survivors.....	4	6	-----	2
Widows.....	845	970	-----	125
Indian wars:				
Survivors.....	5,267	3,915	1,352	-----
Widows.....	3,597	3,100	497	-----
Minor children.....	6	-----	6	-----
Helpless children.....	1	-----	1	-----
World War:				
Invalids.....	47	48	-----	1
Widows.....	10	10	-----	-----
Minor children.....	4	4	-----	-----
Mothers.....	3	3	-----	-----
Total.....	491,194	489,942	70,772	69,520
Net gain to roll.....	1,252	-----	-----	-----

PENSIONS TABLE 13.—*Number of pensioners of the different wars on the roll at the close of each of the last five fiscal years*

	1928	1927	1926	1925	1924
Civil War.....	272,906	302,691	333,494	367,819	399,951
War with Spain.....	191,270	162,638	143,199	120,234	101,142
War of 1812.....	14	17	20	21	33
War with Mexico.....	849	976	1,089	1,274	1,468
Indian wars.....	8,871	7,015	6,902	6,958	6,830
Regular Establishment.....	17,220	16,540	16,951	16,161	16,037
World War.....	64	65	68	70	78
Total.....	491,194	489,942	501,723	512,537	525,539

PENSIONS TABLE 14.—Statement of changes in the pension roll, and disbursements by class, for the fiscal year ended June 30, 1923

	Gains to roll			Gains to class			Losses to roll				Losses to class	Number of pensioners at end of year	Disbursements
	Original	Restoration	Renewal	Original	Renewal	Reissue	By death	By remarriage	By limitation	Failure to claim			
Regular Establishment:													
Soldiers.....	13,085	14	14			1	398			8	147	13,665	\$3,255,566.50
Widows, etc.....	3,455	442	2		2	6	153	48	35	30	84	3,555	840,196.73
Civil War:													
General laws—													
Soldiers.....	963	94	3		8	2	136			1		925	761,325.39
Nurses.....	49						6					43	26,750.00
Widows, etc.....	7,875	699	29			410	815	6	4		84	8,100	3,164,358.44
Act May 1, 1920—													
Soldiers.....	43,998	7				1,769	7,356			1		35,917	35,348,513.31
Widows, etc.....	185,035	4,993	440			6	16,463	187	156	1	2,500	135,297	65,911,553.70
Act July 3, 1926—													
Soldiers.....	45,039	61	2			2,497	7,739			3	1	38,087	33,573,717.58
Widows, etc.....	19,732	235	53	25	35	110	3,758			1		16,431	10,852,757.77
Act May 23, 1928—Widows—	232		15			37,859						138,106	
War with Spain:													
General laws—													
Soldiers.....	2,996	53	2		5	2	47			2	2	1,821	595,861.42
Nurses.....	5	1					1					4	804.67
Widows, etc.....	1,672	68	4			8	145	3	3	2	1	1,587	431,311.49
Act May 1, 1926—													
Soldiers.....	135,816	28,649	7	11	6	1,499	3,276			3	41	162,887	59,312,236.11
Nurses.....	274	97	1			1	9					363	149,820.51
Widows, etc.....	21,875	3,534	70			34	329	303	219		37	24,608	10,184,383.07
War of 1812: Widows.	17						3					14	8,963.34
War with Mexico:													
Soldiers.....	6						2					4	5,886.00
Widows.....	970	8	7				137	3				845	538,520.46
Indian Wars:													
Soldiers.....	3,915	1,492	11	34	1	259	439			1	3	5,267	2,618,189.84
Widows, etc.....	3,100	679	16			82	250	6			2	3,604	1,338,753.96
World War:													
Soldiers.....	48											47	11,365.53
Widows, etc.....	17											17	4,894.67
Total.....	489,942	43,064	29	901	57	44,545	41,462	556	417	22	285	401,194	228,965,672.49

1 No payment under act May 23, 1928, until July²⁴, 1928.

PENSIONS TABLE 15.—*Statement showing the number of pensioners in each class on the roll June 30, 1928, under general pension laws, and special acts of Congress, and their annual value*

Classes	General legislation		Special acts	
	Number	Annual value	Number	Annual value
Regular Establishment:				
Soldiers.....	12,844	\$2,869,263.12	821	\$186,720.00
Widows, etc.....	3,044	600,096.00	511	170,800.00
Civil War:				
General laws—				
Soldiers.....	619	634,044.00	306	176,808.00
Nurses.....	35	21,000.00	8	4,800.00
Widows, etc.....	613	184,644.00	7,487	3,205,344.00
Act of May 1, 1920—				
Soldiers.....	35,917	931,017,108.00		
Widows, etc.....	135,297	48,890,952.00		
Act of July 3, 1926—				
Soldiers.....	38,087	31,683,249.00		
Widows.....	16,431	9,859,956.00		
Act of May 23, 1928—Widows.....	38,106	18,295,272.00		
War with Spain:				
General laws—				
Soldiers.....	1,478	408,999.00	343	100,332.00
Nurses.....			4	768.00
Widows, etc.....	1,354	330,336.00	233	75,596.00
Act of May 1, 1926—				
Soldiers.....	162,887	58,251,758.40		
Nurses.....	363	146,196.00		
Widows, etc.....	24,608	9,906,336.00		
War of 1812: Widows.....	13	7,800.00	1	240.00
War with Mexico:				
Soldiers.....	4	3,888.00		
Widows.....	798	478,800.00	47	18,240.00
Indian wars:				
Soldiers.....	5,079	2,537,820.00	188	75,660.00
Widows, etc.....	3,518	1,266,480.00	86	22,800.00
World War:				
Soldiers.....	46	11,256.00	1	360.00
Widows, etc.....	17	4,776.00		
Total.....	481,158	217,410,029.52	10,036	4,038,468.00

Total number of pensioners.....	491,194
Total annual value.....	\$221,448,497.52
Average annual value of each pension:	
All classes.....	\$450.83
Regular establishment.....	222.23
Act of May 1, 1920.....	466.71
Act of July 3, 1926.....	762.00
General laws—Civil War.....	466.10
Survivors—Civil War.....	847.61
War with Spain.....	361.89

PENSIONS TABLE 16.—*Comparative table of the value of an average pension of the different wars, for the last five fiscal years*

	1928	1927	1926	1925	1924
Civil War.....	\$548.42	\$550.04	\$514.56	\$506.25	\$476.34
War with Spain.....	369.50	351.90	211.05	208.74	202.13
War of 1812.....	635.92	576.80	370.00	447.23	353.45
War with Mexico.....	641.23	582.95	399.25	397.87	365.25
Indian wars.....	446.05	287.06	275.30	281.56	201.78
Regular Establishment.....	237.84	230.83	215.66	207.30	193.69
World War.....	254.06	247.18	254.82	257.60	243.69
Average for all wars.....	466.14	469.75	414.26	423.67	411.02

Average (per capita) amount paid during fiscal year 1923, based on the number on the roll June 30, 1923:	
To soldiers of the Civil War.....	\$929.99
To widows, etc., of the Civil War.....	403.96
To soldiers of the war with Spain.....	363.72
To widows, etc., of the war with Spain.....	405.25

PENSIONS TABLE 18.—*Operations of special examination division for five years*

	1924	1925	1926	1927	1928
Average number of inspectors.....	53	50	48	46	54
Number of depositions taken.....	37,252	34,710	32,367	29,150	35,962
Depositions per inspector.....	703	697	674	637	660
Reports submitted.....	7,267	7,094	7,055	7,299	8,899
Reports per inspector.....	137	143	141	159	163
Cases received during year.....	3,970	4,095	5,660	5,898	8,706
Cases disposed of.....	4,402	4,147	5,473	6,337	7,980
Cases on hand at close of year.....	1,727	1,675	1,862	1,423	2,149
Expended.....	\$117,123.02	\$109,303.23	\$99,557.02	\$96,049.52	¹ \$119,871.47
Cost per case.....	\$26.58	\$26.36	\$18.19	\$15.15	\$14.98

¹ Including \$479.91 charged to the appropriation, "Salaries and expenses, employees' retirement act," Bureau of Pensions, that amount having been expended in connection with the investigation of retirement cases.

PENSIONS TABLE 19.—*Receipts and disbursements account of the civil-service retirement and disability fund*

FISCAL YEAR ENDED JUNE 30, 1921

Transfers on the books of the Treasury Department to the credit of the civil-service retirement and disability fund.....	\$12,513,636.69
Interest, profits, and miscellaneous items.....	72,752.68
Total receipts.....	12,586,389.37
Disbursements on account of annuities.....	2,590,568.52
Disbursements on account of refunds.....	322,964.07
Treasury settlement.....	14.75
Total disbursements.....	2,913,547.34
Balance in the fund June 30, 1921.....	9,672,842.03

FISCAL YEAR ENDED JUNE 30, 1922

Balance in the fund July 1, 1921.....	9,672,842.03
Transfers on the books of the Treasury Department to the credit of the civil-service retirement and disability fund.....	14,266,494.35
Interest, profits, and miscellaneous items.....	587,254.64
Total in fund.....	24,526,591.02
Disbursements on account of annuities.....	4,188,258.89
Disbursements on account of refunds (including \$40,111.12 interest).....	2,203,198.04
Treasury settlements.....	870.18
Total disbursements.....	6,392,327.11
Balance in the fund June 30, 1922.....	18,134,263.91

FISCAL YEAR ENDED JUNE 30, 1923

Balance in the fund July 1, 1922.....	18,134,263.91
Transfers on the books of the Treasury Department to the credit of the civil-service retirement and disability fund.....	14,112,827.70
Interest, profits, and miscellaneous items.....	1,042,781.58
Total in fund.....	33,289,873.19
Disbursements on account of annuities.....	4,964,001.92
Disbursements on account of refunds (including \$107,904.39 interest).....	2,785,755.97
Treasury settlements.....	29,826.33
Total disbursements.....	7,779,584.22
Balance in the fund June 30, 1923.....	25,510,288.97

FISCAL YEAR ENDED JUNE 30, 1924

Balance in the fund July 1, 1923.....	\$25, 510, 288. 97
Transfers on the books of the Treasury Department to the credit of the civil-service retirement and disability fund....	15, 109, 451. 49
Interest, profits, and miscellaneous items.....	1, 523, 034. 44
Total in fund.....	42, 142, 774. 90
Disbursements on account of annuities.....	5, 692, 443. 59
Disbursements on account of refunds (including \$144,127.42 interest).....	2, 864, 138. 12
Total disbursements.....	8, 556, 581. 71
Balance in the fund June 30, 1924.....	33, 586, 193. 19

FISCAL YEAR ENDED JUNE 30, 1925

Balance in the fund July 1, 1924.....	33, 586, 193. 19
Transfers on the books of the Treasury Department to the credit of the civil-service retirement and disability fund.....	17, 905, 070. 98
Interest, profits, and miscellaneous items.....	2, 123, 796. 71
Total in fund.....	53, 615, 060. 88
Disbursements on account of annuities.....	6, 235, 830. 16
Disbursements on account of refunds (including \$171,071.86 interest).....	2, 713, 452. 16
Total disbursements.....	8, 949, 282. 32
Balance in the fund June 30, 1925.....	44, 665, 778. 56

FISCAL YEAR ENDED JUNE 30, 1926

Balance in the fund July 1, 1925.....	44, 665, 778. 56
Transfers on the books of the Treasury Department to the credit of the civil-service retirement and disability fund.....	17, 871, 530. 80
Interest, profits, and miscellaneous items.....	2, 302, 161. 06
Total in fund.....	64, 839, 470. 42
Disbursements on account of annuities.....	6, 766, 601. 17
Disbursements on account of refunds (including \$262,315.88 interest).....	3, 443, 864. 32
Total disbursements.....	10, 210, 465. 49
Balance in the fund June 30, 1926.....	54, 629, 004. 93

FISCAL YEAR ENDED JUNE 30, 1927

Balance in the fund July 1, 1926.....	54, 629, 004. 93
Transfers on the books of the Treasury Department to the credit of the civil-service retirement and disability fund.....	24, 355, 882. 00
Interest, profits, and miscellaneous items.....	2, 812, 581. 84
Total in fund.....	81, 797, 468. 77
Disbursements on account of annuities.....	9, 598, 285. 73
Disbursements on account of refunds (including \$329,869.02 interest).....	3, 862, 288. 82
Treasury settlement.....	133. 27
Total disbursements.....	13, 460, 707. 82
Balance in the fund June 30, 1927.....	68, 336, 760. 95

FISCAL YEAR ENDED JUNE 30, 1928

Balance in the fund July 1, 1927.....	\$68, 336, 760. 95
Transfers on the books of the Treasury Department to the credit of the civil-service retirement and disability fund.....	26, 454, 611. 68
Interest, profits, and miscellaneous items.....	3, 048, 244. 55
Total in fund.....	97, 839, 617. 18
Disbursements on account of annuities.....	10, 990, 454. 10
Disbursements on account of refunds (including \$348,445.44 interest).....	3, 771, 162. 65
Total disbursements.....	14, 761, 616. 75
Balance in the fund June 30, 1928.....	83, 078, 000. 43

PENSIONS TABLE 20.—*Statement showing by vocations the number, sex, and cause for which retired of annuitants on the roll June 30, 1928, together with aggregate contributions made by them*

	Total number	Male		Female		Aggregate contribu- tions
		Retired for age	Retired for disa- bility	Retired for age	Retired for disa- bility	
Mechanics.....	3, 362	2, 684	466	169	43	\$456, 349
City letter carriers.....	2, 698	2, 008	690			464, 644
Rural letter carriers.....	2, 452	2, 117	328	1	6	392, 272
Post-office clerks.....	1, 355	896	283	116	60	229, 899
Railway mail clerks.....	1, 191	1, 060	131			190, 140
Departmental and other clerks.....	3, 311	1, 905	663	421	322	513, 982
Classified laborers.....	899	609	118	104	68	102, 835
Unclassified laborers.....	115	82	31	1	1	36, 995
Total.....	15, 383	11, 361	2, 710	812	500	2, 387, 116
Average contributions.....						155. 18

PENSIONS TABLE 21.—*Statement showing the number of annuitants by rates, the average annuity, and the annual value of the retirement roll, June 30, 1928*

Number receiving less than \$100 per annum.....	9
Number receiving between \$100 and \$200 per annum.....	116
Number receiving between \$200 and \$300 per annum.....	428
Number receiving between \$300 and \$400 per annum.....	854
Number receiving between \$400 and \$500 per annum.....	1, 723
Number receiving between \$500 and \$600 per annum.....	1, 590
Number receiving between \$600 and \$700 per annum.....	1, 655
Number receiving between \$700 and \$800 per annum.....	1, 761
Number receiving between \$800 and \$900 per annum.....	2, 277
Number receiving between \$900 and \$999.96 per annum.....	1, 668
Number receiving the maximum annuity of \$999.96 per annum.....	3, 302
Total.....	15, 383

PENSIONS TABLE 22.—Statement showing, by age groups and within certain ranges, the average salary received during the last 10 years of service by the annuitants on the roll, June 30, 1928

Average salary	Total	62 years	65 years	70 years	Aggregate compensation	Aggregate annuities
Less than \$300.....	24		19	5	\$5, 774	\$3, 090
\$300 to \$600.....	192	4	149	39	90, 094	46, 681
\$600 to \$900.....	1, 110	8	676	426	867, 318	451, 643
\$900 to \$1,200.....	2, 563	28	1, 917	618	2, 769, 246	1, 344, 801
\$1,200 to \$1,500.....	4, 867	298	3, 603	966	6, 549, 364	3, 709, 758
\$1,500 to \$1,800.....	4, 334	442	3, 368	524	7, 146, 289	3, 694, 765
\$1,800 to \$2,100.....	1, 445	300	779	366	2, 763, 849	1, 272, 259
\$2,100 to \$2,400.....	500	192	152	156	1, 108, 638	457, 325
\$2,400 to \$2,700.....	155	17	45	93	391, 608	135, 567
\$2,700 to \$3,000.....	86	10	27	49	245, 130	79, 300
\$3,000 to \$3,300.....	51	3	16	32	159, 711	45, 776
\$3,300 to \$3,600.....	21	3	6	12	71, 964	18, 608
\$3,600 and over.....	35	1	9	25	149, 868	30, 319
Total.....	15, 383	1, 306	10, 766	3, 311	22, 318, 853	11, 289, 892

Average annuity..... \$733. 92
 Average annual compensation..... 1, 450. 88

PENSIONS TABLE 23.—Information concerning number of annuitants and disbursements, civil-service retirement fund, by fiscal years

Number of annuitants on the roll June 30, 1921.....	6, 471
Disbursements on account of annuities during fiscal year.....	\$2, 590, 568. 52
Number of annuitants on the roll June 30, 1922.....	7, 576
Disbursements on account of annuities during fiscal year.....	\$4, 188, 258. 89
Number of annuitants on the roll June 30, 1923.....	9, 334
Disbursements on account of annuities during fiscal year.....	\$4, 964, 001. 92
Number of annuitants on the roll June 30, 1924.....	10, 548
Disbursements on account of annuities during fiscal year.....	\$5, 692, 443. 59
Number of annuitants on the roll June 30, 1925.....	11, 689
Disbursements on account of annuities during fiscal year.....	\$6, 235, 830. 16
Number of annuitants on the roll June 30, 1926.....	12, 524
Disbursements on account of annuities during fiscal year.....	\$6, 766, 601. 17
Number of annuitants on the roll June 30, 1927.....	14, 119
Disbursements on account of annuities during fiscal year.....	\$9, 598, 285. 73
Number of annuitants on the roll June 30, 1928:	
Retired for age.....	12, 173
Retired for disability.....	3, 210
Total.....	15, 383
Disbursements during fiscal year:	
On account of annuities.....	\$10, 990, 454. 10
On account of refunds.....	3, 771, 162. 65
Total.....	\$14,761,616. 75
Number of annuitants dropped during fiscal year:	
On account of death.....	1, 271
For other causes.....	85
Total.....	1, 356
Certificates issued during the year:	
Originals.....	2, 583
Reissues.....	119
Restorations.....	7
Renewals.....	29
Total.....	2, 738
Number of annuitants who are also pensioners.....	1, 321
Number of annuitants under guardianship.....	108
Number of refunds paid.....	27, 177
Number of refunds carrying interest.....	25, 401
Amount of interest paid.....	\$348, 445. 44
Average amount of each refund paid.....	\$138. 76

GEOLOGICAL SURVEY

GEOLOGICAL SURVEY TABLE 1.—*Summary of outstanding mineral withdrawals and classifications June 30, 1928*

State	Coal		Oil		Oil shale		Phosphate		Potash
	With- drawn	Classified as coal land	With- drawn	Classi- fied as oil land	With- drawn	Classi- fied as oil shale land	With- drawn	Classi- fied as phos- phate land	With- drawn
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alaska.....		56,993							
Arizona.....	139,415		92,496						
Arkansas.....		61,160							
California.....	17,603	8,720	1,178,392						90,357
Colorado.....	4,180,016	3,145,867	218,997		64,560	952,239			
Florida.....							68,596	120	
Idaho.....	4,761	4,603					391,532	268,299	
Louisiana.....			466,990	4,233					
Montana.....	7,883,164	8,560,671	1,350,426	67,651			279,944	3,833	
Nevada.....	83,673				123				39,422
New Mexico.....	5,084,069	570,372							7,418,437
North Dakota.....	5,954,364	11,178,286	84,894						
Oregon.....	4,361	18,887							
South Dakota.....		250,093							
Utah.....	3,636,541	1,267,697	1,341,264		91,464	2,703,755	301,945	160	
Washington.....	691,801	141,444							
Wyoming.....	2,260,604	6,738,516	541,777			460,103	989,289	25,293	
Total.....	29,940,372	32,003,309	5,275,236	71,884	156,147	4,116,097	2,031,306	297,705	7,548,216

GEOLOGICAL SURVEY TABLE 2.—*Applications received, acted on, and pending under the mineral-leasing acts, fiscal year 1928*

Mineral	Permits			Leases			Patents		
	Re- ceived	Acted on	Pend- ing	Re- ceived	Acted on	Pend- ing	Re- ceived	Acted on	Pend- ing
Oil and gas.....	4,434	5,025	377	1	3				
Coal.....	164	189	6	99	100	9			
Phosphate.....				4	9	1			
Sodium.....	12	12		1	1				
Potassium.....	112	116		5	3	2	1		1
Oil shale.....				4	4				

GEOLOGICAL SURVEY TABLE 3.—*Producing oil and gas fields, with dates defined and net acreage outstanding June 30, 1928, in accordance with the act of February 25, 1920*

California:

	Acres
Buena Vista Hills field, Aug. 11, 1920, May 18, 1925, Aug. 15, 1923, Feb. 11, 1924, Mar. 26, 1925, June 12, 1925.....	32,282
Coalinga east side field, July 20, 1920.....	9,760
Coalinga west side field, July 20, 1920.....	15,002
Elk Hills field, Aug. 11, 1920, Nov. 19, 1923.....	38,902
Kern River field, July 15, 1920.....	34,866
Lost Hills field, July 20, 1920.....	4,206
McKittrick field, Aug. 11, 1920, May 18, 1923, Oct. 6, 1924.....	6,376
McKittrick front field, Aug. 11, 1920.....	4,882
Midway field, Aug. 17, 1920, May 18, 1923.....	26,536
Sunset field, Aug. 11, 1920.....	12,183
Wheeler Ridge field, Mar. 25, 1925.....	880

	Acres
Colorado:	
Garmesa field, Mar. 30, 1925	4, 672
Hamilton dome, Feb. 19, 1924	4, 357
North McCallum field, Mar. 17, 1927	3, 081
Wellington anticline, Jan. 28, 1924	4, 365
White River dome, Dec. 19, 1922 (13,208 acres canceled Apr. 13, 1926)	
Williams Park anticline, May 17, 1923	4, 266
Montana:	
Baker field, Jan. 5, 1922	5, 629
Cat Creek field, Apr. 2, 1920, Apr. 4, 1921, June 21, 1927	2, 918
Elk Basin field, Dec. 16, 1924	581
(Additional acreage, same field, in Wyoming, 2,319.)	
Gas City field, Jan. 5, 1922	1, 275
Gas Ridge field, Dec. 9, 1922, Apr. 20, 1926	16, 587
Kevin-Sunburst field, Dec. 9, 1922, Apr. 20, 1926	47, 691
Shelby field, Dec. 9, 1922, Apr. 20, 1926	23, 906
New Mexico:	
Artesia field, Nov. 6, 1925, Nov. 14, 1925	21, 533
Aztec field, Jan. 9, 1924	1, 600
Oklahoma:	
East Red River oil field, Aug. 22, 1924 (156 acres canceled Feb. 3, 1927)	
Middle Red River oil field, Aug. 22, 1924, Oct. 3, 1924, Feb. 3, 1927	222
West Red River oil field, Aug. 22, 1924, Feb. 3, 1927	403
Utah:	
Ashley Creek field, Oct. 14, 1927	1, 240
Cisco dome, Feb. 25, 1925	13, 515
Virgin oil field, Aug. 30, 1924	520
Woodside field, May 19, 1924, Jan. 27, 1926	12, 375
Wyoming:	
Alkali Butte field, Dec. 1, 1923	399
Big Muddy field, Aug. 20, 1920	6, 427
Big Polecat field, Apr. 2, 1923	1, 697
Big Sand Draw field, Apr. 2, 1920	7, 393
Billy Creek field, Feb. 8, 1924	3, 560
Black Mountain anticline, Mar. 30, 1925	2, 865
Bolton Creek field, Nov. 30, 1921	720
Boone dome, Feb. 4, 1924	2, 320
Buffalo Basin field, Aug. 18, 1920	7, 922
Byron field, July 20, 1920	224. 35
Derby dome, Dec. 19, 1922	926
Dry Piney field, Apr. 2, 1920 (2,559 acres canceled Nov. 25, 1924)	
East Ferris dome, Apr. 7, 1926	876
East Warm Springs field, Nov. 10, 1924	312
Elk Basin field, Dec. 16, 1924, Dec. 30, 1924, Mar. 16, 1927	2, 319
(Additional acreage, same field, in Montana, 581).	
Elk Butte field, July 15, 1920	2, 002
Garland field, July 20, 1920	587. 94
Grass Creek field, Aug. 18, 1920	3, 067
Greybull field, Apr. 26, 1921	95. 93
Hamilton dome, Apr. 5, 1920	11, 087
Hatfield dome, Sept. 21, 1925	1, 676
Hidden dome, Apr. 20, 1922	1, 067
Iron Creek field, Sept. 17, 1920	920
Lamb anticline, Mar. 12, 1925	1, 944
Lance Creek field, Apr. 2, 1920	10, 736
Little Grass Creek field, Sept. 19, 1921	1, 240
Little Polecat field, Apr. 2, 1923	1, 076
Lost Soldier field, July 28, 1927	960
Mahoney dome, Dec. 15, 1920, Aug. 11, 1921, Sept. 21, 1925	8, 229
Middle Baxter Basin field, Apr. 27, 1925	1, 800
Mule Creek field, Apr. 5, 1920	1, 527
North Baxter Basin field, Apr. 27, 1925	2, 716
Notches dome, Dec. 13, 1923	960
Osage field, Aug. 25, 1920, Oct. 5, 1920	15, 224

Wyoming—Continued.

	Acres
Poison Spider field, Sept. 17, 1920.....	5, 359
Rex dome, Sept. 21, 1925.....	1, 360
Rock Creek field, Apr. 2, 1920.....	4, 354
Salt Creek field, Apr. 2, 1920.....	34, 398
South Baxter Basin field, Apr. 27, 1925.....	3, 120
South Sunshine field, Aug. 4, 1927.....	2, 702
Thornton field, Apr. 5, 1920.....	1, 274
Torchlight dome, Oct. 30, 1920, Oct. 26, 1923.....	1, 004
Wertz dome, Dec. 15, 1920, Feb. 25, 1927.....	1, 009
West Ferris dome, Apr. 7, 1926, Apr. 9, 1926.....	720
West Warm Springs field, Nov. 10, 1924.....	80
Wiley anticline, July 20, 1920.....	879

GEOLOGICAL SURVEY TABLE 4.—*Power-site reserves*

[Includes all areas reserved or classified as valuable for power purposes and withheld subject to disposal only under the Federal water power act of June 10, 1920 (41 Stat. 1063). Designations, classifications, and other types of reserves are included in the total areas without distinction]

State	Reserved prior to July 1, 1927	Elimi- nated prior to July 1, 1927	Reserves outstand- ing prior to July 1, 1927	Reserved during fiscal year	Elimi- nated during fiscal year	Reserves outstand- ing June 30, 1928
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alabama.....	2, 377	-----	2, 377	-----	-----	2, 377
Alaska.....	218, 177	520	217, 657	28, 889	-----	246, 546
Arizona.....	1, 275, 681	124, 010	1, 151, 671	7, 295	2	1, 158, 964
Arkansas.....	29, 671	-----	29, 671	-----	360	29, 311
California.....	1, 315, 213	30, 243	1, 284, 970	52, 823	-----	1, 337, 793
Colorado.....	531, 273	75, 783	455, 490	6, 247	1, 237	460, 500
Florida.....	1, 019	-----	1, 019	112	-----	1, 131
Idaho.....	590, 545	191, 521	399, 024	15, 097	13	414, 108
Michigan.....	1, 240	-----	1, 240	-----	-----	1, 240
Minnesota.....	19, 062	532	18, 530	-----	-----	18, 530
Mississippi.....	3	-----	3	-----	-----	3
Montana.....	303, 766	96, 379	207, 387	723	-----	208, 110
Nebraska.....	761	-----	761	-----	-----	761
Nevada.....	301, 196	480	300, 716	-----	-----	300, 716
New Mexico.....	270, 878	10, 511	260, 367	-----	-----	260, 367
Oregon.....	753, 183	112, 248	640, 935	16, 021	11, 715	645, 241
South Dakota.....	52	-----	52	584	-----	636
Utah.....	756, 709	126, 398	630, 311	15, 224	120	645, 415
Washington.....	392, 759	53, 835	338, 924	5, 256	-----	344, 180
Wisconsin.....	1, 853	226	1, 627	13	-----	1, 640
Wyoming.....	222, 622	75, 346	147, 276	9, 855	938	156, 193
Total.....	6, 988, 040	898, 032	6, 090, 008	158, 139	14, 385	6, 233, 762

GEOLOGICAL SURVEY TABLE 5.—*Public-water reserves*

[Includes areas withdrawn under the act of June 25, 1910 (41 Stat. 1063), as amended by the act of Aug. 24, 1912 (37 Stat. 497), and reserved for public use of springs or water holes in accordance with the provisions of sec. 10 of the act of Dec. 29, 1915 (39 Stat. 862), or for watershed protection, drainage reservoirs, or other similar miscellaneous public purposes involving water conservation]

State	Reserved prior to July 1, 1927	Elimi- nated prior to July 1, 1927	Reserves outstand- ing prior to July 1, 1927	Reserved during fiscal year	Elimi- nated during fiscal year	Reserves outstand- ing June 30, 1928
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	19, 177	1, 602	17, 575	2, 605	30	20, 150
California.....	178, 412	7, 130	171, 282	27, 512	8	198, 786
Colorado.....	2, 660	360	2, 300	2, 560	-----	4, 860
Idaho.....	13, 755	410	13, 345	590	-----	13, 905
Montana.....	9, 209	1, 152	8, 057	800	-----	8, 857
Nevada.....	12, 506	3, 250	9, 256	1, 920	-----	11, 176
New Mexico.....	10, 401	520	9, 881	-----	-----	9, 881
Oregon.....	21, 789	1, 288	20, 501	760	-----	21, 261
South Dakota.....	240	-----	240	-----	-----	240
Utah.....	39, 791	6, 876	32, 915	1, 735	720	33, 930
Washington.....	920	-----	920	-----	-----	920
Wyoming.....	92, 605	13, 300	79, 305	240	120	79, 425
Total.....	401, 465	35, 888	365, 577	38, 692	878	403, 391

GEOLOGICAL SURVEY TABLE 6.—*Summary of enlarged homestead designations*

[Areas classified as arid and nonirrigable, residence by entrymen required (act of Feb. 19, 1909 (35 Stat. 639), applicable to Arizona, Colorado, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming; act of June 17, 1910 (36 Stat. 531), applicable to Idaho; act of June 13, 1912 (37 Stat. 132), applicable to California, North Dakota; act of Mar. 3, 1915 (38 Stat. 953), applicable to Kansas; act of Mar. 4, 1915 (38 Stat. 1163), applicable to South Dakota.) Areas classified as arid, nonirrigable, and lacking domestic water supply, residence by entrymen not required (act of Feb. 19, 1909 (35 Stat. 639), applicable to Utah; act of June 17, 1910 (36 Stat. 531), applicable to Idaho)]

State	Designations prior to July 1, 1927	Cancellations prior to July 1, 1927	Designations outstanding prior to July 1, 1927	Designations during fiscal year	Cancellations during fiscal year	Designations outstand- ing June 30, 1928
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	31, 431, 179	5, 870, 874	25, 560, 305	71, 405	-----	25, 631, 710
California.....	13, 277, 544	238, 453	13, 039, 091	55, 682	2, 000	13, 092, 773
Colorado.....	33, 718, 793	195, 508	33, 523, 285	91, 834	-----	33, 615, 119
Idaho:						
Total.....	13, 690, 819	460, 925	13, 229, 894	63, 371	440	¹ 13, 292, 825
Nonresidence.....	572, 747	4, 233	568, 514	480	-----	568, 994
Kansas.....	650, 404	-----	650, 404	960	-----	651, 364
Montana.....	53, 457, 850	245, 728	53, 212, 122	27, 800	-----	53, 239, 922
Nevada.....	50, 168, 165	3, 580, 717	46, 587, 448	-----	-----	46, 587, 448
New Mexico.....	43, 772, 180	227, 732	43, 544, 448	65, 177	-----	43, 609, 625
North Dakota.....	12, 277, 704	3, 848	12, 273, 856	3, 000	-----	12, 276, 856
Oregon.....	21, 276, 707	989, 902	20, 286, 805	5, 604	-----	20, 292, 409
South Dakota.....	16, 336, 096	348, 170	15, 987, 926	4, 665	-----	15, 992, 591
Utah:						
Total.....	11, 651, 754	700, 084	10, 951, 670	3, 022	1, 400	² 10, 953, 292
Nonresidence.....	1, 647, 889	81, 560	1, 566, 329	3, 022	320	1, 569, 031
Washington.....	6, 655, 192	251, 842	6, 403, 350	5, 260	-----	6, 408, 610
Wyoming.....	29, 594, 332	162, 043	29, 432, 289	82, 960	-----	29, 515, 249
Total.....	337, 958, 719	13, 275, 826	324, 682, 893	480, 740	3, 840	325, 159, 793

¹ Previously designated under secs. 1-5, now designated under sec. 6.

² Includes 1,080 acres previously designated under secs. 1-5, now designated under sec. 6.

GEOLOGICAL SURVEY TABLE 7.—*Summary of stock-raising homestead designations*

[Areas classified as nonirrigable, nontimbered, chiefly valuable for grazing and raising forage crops, and of such character that 640 acres are reasonably required for the support of a family. Act of December 29, 1916 (39 Stat. 862)]

State	Designations prior to July 1, 1927	Cancel- lations prior to July 1, 1927	Designations outstanding prior to July 1, 1927	Designa- tions during fiscal year	Cancel- lations during fiscal year	Designations outstanding June 30, 1928
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	13,988,504	887,580	13,100,924	68,162		13,169,086
Arkansas.....	1,120		1,120			1,120
California.....	7,888,299	1,400	7,886,899	77,605	2,000	7,962,504
Colorado.....	8,511,501	18,840	8,492,661	136,077	80	8,628,688
Florida.....	480	480				
Idaho.....	5,449,617	1,854	5,447,763	95,674		5,543,437
Kansas.....	114,139		114,139	1,000		115,139
Michigan.....	3,451		3,451	40		3,491
Montana.....	15,349,734	17,081	15,332,653	137,389		15,470,042
Nebraska.....	194,809		194,809	7,375		202,184
Nevada.....	566,094	3,120	562,974	19,995		582,969
New Mexico.....	31,284,608	636	31,283,972	79,345		31,363,317
North Dakota.....	375,892		375,892	7,808		383,700
Oklahoma.....	82,082		82,082	1,528		83,610
Oregon.....	6,310,759	3,128	6,307,631	44,619		6,352,250
South Dakota.....	6,496,538	550	6,495,988	13,510		6,509,498
Utah.....	1,651,770	6,520	1,645,250	144,379	1,280	1,788,349
Washington.....	690,161	1,134	689,027	4,525	40	693,512
Wyoming.....	20,089,648	6,213	20,083,435	188,463	160	20,271,738
Total.....	119,049,206	948,536	118,100,670	1,027,494	3,560	119,124,604

GEOLOGICAL SURVEY TABLE 8.—*Summary of outstanding water resources, with-
drawals, and classifications, June 30, 1928*

State	Power reserves					Reser- voir with- drawals	Public- water r.serves	Ground- water reclama- tion desig- nations
	With- drawals	Classifi- cations	Desig- nations ¹	Miscella- neous	Total			
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alabama.....	120	1,735		522	2,377			
Alaska.....	93,415	70,825		82,306	246,546			
Arizona.....	386,259	37,182	528,237	207,286	1,158,964	23,040	20,150	
Arkansas.....	21,994	1,590		5,727	29,311			
California.....	287,391	322,129		728,273	1,337,793	1,160	198,786	
Colorado.....	230,673	175,770		54,057	460,500	1,728	4,860	
Florida.....				1,131	1,131			
Idaho.....	205,637	195,117		13,354	414,108		13,905	
Michigan.....	1,240				1,240			
Minnesota.....	12,309			6,221	18,530			
Mississippi.....				3	3			
Montana.....	129,944	53,452		24,714	208,110	9,080	8,857	
Nebraska.....	761				761			
Nevada.....	27,492	28,026		245,198	300,716		11,176	1,619,215
New Mexico.....	117,206		143,161		260,367		9,881	
North Dakota.....						1,569		
Oregon.....	361,063	203,872	15,250	65,056	645,241	10,619	21,261	
South Dakota.....				636			240	
Utah.....	442,375	168,943		34,097	645,415	80	33,930	
Washington.....	97,086	180,691		66,403	344,180	35,943	920	
Wisconsin.....				1,640	1,640			
Wyoming.....	79,953	35,407		40,833	156,193	1,714	79,425	
Total.....	2,494,918	1,474,739	686,648	1,577,457	6,233,762	84,933	403,391	1,619,215

¹ Designated and not otherwise withdrawn.

GEOLOGICAL SURVEY TABLE 9.—*Mineral leases, licenses, and permits on the public domain and naval petroleum reserves under supervision of the Geological Survey as of June 30, 1928*

State	Coal						Oil and gas	
	Leases		Permits		Licenses		Leases	Permits
	Num- ber	Acreage	Num- ber	Acreage	Num- ber	Acreage		
Alaska.....	9	11,307.28	7	12,115.66				1,028
Alabama.....	1	1,840.00						4
Arizona.....			7	16,560.00				568
Arkansas.....			1	120.00				13
California.....			6	4,478.51			151	2,087
Colorado.....	68	11,907.65	32	20,252.00	7	280.00	12	3,129
Idaho.....			4	5,402.91				247
Kansas.....								6
Louisiana.....							6	250
Michigan.....								1
Mississippi.....								3
Montana.....								
Nebraska.....	50	6,694.21	9	7,600.00	8	319.95	47	1,855
Nevada.....			3	6,021.88				4
New Mexico.....	13	6,410.38	59	98,660.21			6	506
North Dakota.....	41	5,856.44	2	320.46	1	40.00		4,286
Oklahoma.....							18	29
Oregon.....	2	1,895.24	1	40.00				85
South Dakota.....	1	79.04						50
Utah.....	43	33,052.77	21	22,492.64	2	120.00	4	118
Washington.....	1	600.00	9	5,862.33				3,298
Wyoming.....	35	15,982.98	15	11,914.69	5	199.95	299	74
Wyoming.....								4,285
Total.....	264	95,625.99	176	211,841.29	23	959.99	543	21,726

State	Sodium				Potash			
	Leases		Permits		Leases		Permits	
	Num- ber	Acreage	Num- ber	Acreage	Num- ber	Acreage	Num- ber	Acreage
Arizona.....	{		5	12,480.00			23	57,440.00
California.....			4	5,115.96	4	7,783.80	35	9,040.00
Colorado.....	{						1	2,559.58
Idaho.....							18	37,945.00
Nevada.....	1	1,440.00	2	3,254.11			1	2,538.67
New Mexico.....	{		2	5,120.00			20	42,960.00
Oregon.....			8	16,661.04			51	120,960.00
Utah.....			3	3,840.00			1	2,560.00
Washington.....			1	1,245.00			17	36,998.68
Wyoming.....								
Total.....	1	1,440.00	25	47,716.11	4	7,783.80	137	313,001.93

Idaho, 2 phosphate leases.....acres 1,700
Oregon, 1 oil-shale lease.....do 2,680

Total:

Leases.....815
Licenses.....23
Permits.....22,054

Grand total.....22,892

¹ Includes 15 leases on Naval Petroleum Reserves Nos. 1 and 2 under the act of Feb. 25, 1920, and 11 on Naval Petroleum Reserves Nos. 1 and 2 under the act of June 4, 1920.

² Oil and gas permits in Louisiana include the right to lease sulphur deposits discovered while prospecting for oil and gas.

³ Under act 2-7-27.

BUREAU OF RECLAMATION

RECLAMATION TABLE 1.—Consolidated financial statement, June 30, 1928

		DEBIT SIDE	
Construction account:			
Primary projects—			
Cost of irrigation works—			
Original construction.....	\$166,864,907.03		
Supplemental construction.....	9,765,702.15		
Value of works taken over.....	2,057,428.36		
Total construction cost.....		\$178,688,037.54	
Operation and maintenance prior to public notice (net).....	2,523,387.09		
Operation and maintenance deficits and arrearages funded with construction.....	4,036,667.31		
Penalties on water-right charges funded with construction.....	1,066,139.07		
		7,626,193.47	
		186,314,231.01	
Less—			
Abandoned works, nonreimbursable cost and charge-offs.....	13,235,395.09		
Construction revenues.....	5,723,302.78		
Contributed funds.....	1,248,813.73		
		20,207,511.60	
Balance repayable.....		\$166,106,719.41	
Yuma auxiliary project—			
Cost of irrigation works.....	875,417.93		
Less: Construction revenues.....	236.87		
Secondary projects and general investigations:		875,181.06	
Cost of investigations.....	2,782,513.51		
Less: Contributed funds.....	544,235.12		
		2,238,278.39	
Operation and maintenance results.....		¹ 187,406.82	
Plant and equipment.....		949,612.67	
Materials and supplies.....		627,062.24	
Accounts receivable:			
Current accounts due.....	3,979,499.50		
Deferred accounts not due.....	151,439,508.52		
		155,419,008.02	
Prepaid civil service retirement fund.....		2,340.33	
General office expense undistributed.....		449,766.63	
Unadjusted debits: Disbursement vouchers in transit and townsite development expense.....		33,296.29	
Cash:			
Balance on hand—			
Reclamation fund.....	\$9,208,247.50		
Yuma auxiliary fund.....	128,761.83		
Special funds.....	100,025.54		
		\$9,437,034.87	
Cash in special deposit and in transit.....		34,530.35	
		9,471,565.22	
Total debits.....		335,985,423.44	

¹ Operation and maintenance charges in excess of net costs.

CREDIT SIDE

Security for repayment of cost of irrigation works:			
Contracted construction repayments.....		\$182, 130, 131. 21	
Yuma auxiliary contracted repayments.....		712, 785. 01	
			\$182, 842, 916. 22
Current accounts payable.....			1, 664, 791. 29
Unadjusted credits: Collection vouchers in transit and field cost adjustments.....			83, 432. 20
Unapplied credits: Forfeitures, penalties, hospital results, rentals of withdrawn lands, etc.....			4, 548, 234. 48
Government aid for reclamation of arid lands:			
Reclamation fund.....		\$143, 741, 593. 71	
Special funds—			
Increase of compensation.....		2, 797, 960. 33	
Rio Grande Dam.....		1, 000, 000. 00	
Wind River Indian (Riverton).....		359, 176. 04	
Judgments, Court of Claims.....		599, 651. 24	
General investigations, 1923-Dec. 31, 1924.....		275, 000. 00	
Columbia Basin irrigation project.....		25, 000. 00	
Arid, semiarid, swamp, and cut-over timberlands.....		30, 000. 00	
Drainage and cut-over lands.....		99, 815. 08	
Colorado River levee system.....		100, 000. 00	
Total.....		149, 028, 196. 40	
Advances to reclamation fund (bond loan).....	\$20, 000, 000. 00		
Less: Amount repaid.....	8, 000, 000. 00		
		12, 000, 000. 00	
		161, 028, 196. 40	
Less: Nonreimbursable appropriation, Rio Grande Dam.....		1, 000, 000. 00	
		160, 028, 196. 40	
Less: Impairment of funds—			
Abandoned works.....	\$1, 361, 969. 81		
Nonreimbursable cost.....	382, 097. 31		
Operation and maintenance cost uncollectible.....	453, 290. 99		
Charge-offs, act of May 25, 1926.....	10, 947, 241. 32		
		13, 182, 147. 15	
			146, 846, 049. 25
Total credits.....			335, 985, 423. 44

RECLAMATION TABLE 2.—*Available funds, expenditures, and balances, fiscal year 1928*

Items	Funds					
	Reclamation	Yuma auxiliary	General investigations	Arid, semiarid, swamp, and cut-over timber lands	Columbia Basin irrigation project	Colorado River levee system
Balance on hand July 1, 1927.....	\$9, 492, 384. 44	\$97, 115. 01	\$8, 764. 84	\$2, 671. 80	\$20, 929. 45	-----
Receipts:						
Proceeds from sale of public lands.....	705, 822. 66	-----	-----	-----	-----	-----
Proceeds from sale of town lots.....	¹ 22, 767. 56	-----	-----	-----	-----	-----
Proceeds from oil leasing act.....	2, 454, 168. 66	-----	-----	-----	-----	-----
Proceeds from potassium royalties.....	5, 552. 90	-----	-----	-----	-----	-----
Proceeds from Federal power licenses.....	10, 565. 63	-----	-----	-----	-----	-----
From sale of lands and water rights.....	-----	31, 646. 82	-----	-----	-----	-----
From project collections.....	6, 149, 987. 92	-----	-----	-----	-----	-----
From General Treasury.....	-----	-----	-----	15, 000. 00	-----	\$100, 000. 00
Total.....	18, 795, 714. 65	128, 761. 83	8, 764. 84	17, 671. 80	20, 929. 45	100, 000. 00
Expenditures:						
Repayment bond loan.....	1, 000, 000. 00	-----	-----	-----	-----	-----
Disbursements.....	8, 587, 467. 15	-----	117. 50	14, 795. 14	6, 875. 37	25, 552. 54
Total.....	9, 587, 467. 15	-----	117. 50	14, 795. 14	6, 875. 37	25, 552. 54
Balance on hand, June 30, 1928.....	9, 208, 247. 50	128, 761. 83	8, 647. 34	2, 876. 66	14, 054. 08	74, 447. 46

¹ Contra.

RECLAMATION TABLE 3.—*Accretions to reclamation fund, by States*

States	Sales of public lands		Sales of reclamation town sites		Proceeds from oil leasing act		Potassium royalties and rentals ¹	Total to June 30, 1928
	Fiscal year 1928	To June 30, 1928	Fiscal year 1928	To June 30, 1928	Fiscal year 1928	To June 30, 1928		
Alabama.....	\$57,695.94	\$2,327,432.50			\$1,593.96	\$48,247.93		\$48,247.93
Arizona.....	95,763.38	7,740,008.05			728,649.82	6,727,724.78		2,327,432.50
California.....	66,384.70	9,972,014.70			50,807.92	221,306.75	\$40,167.12	14,507,899.95
Colorado.....	41,046.38	6,835,695.50			1,303.25	3,048.52		10,193,321.45
Idaho.....		1,032,764.48						7,012,491.11
Kansas.....								4,032,764.48
Louisiana.....	73,730.16	14,976,402.45			2,046.24	12,108.40		12,108.40
Montana.....	1,425.56	2,089,972.47			62,506.69	798,940.97		15,886,596.72
Nebraska.....	14,241.77	966,484.09						2,089,972.47
Nevada.....	85,617.09	6,052,490.03			768.10	2,688.10		969,172.19
New Mexico.....	643.27	12,206,555.64			13,563.52	36,641.88		6,089,131.91
North Dakota.....	688.99	5,925,350.20			17,193.82	39,194.73		12,246,750.37
Oklahoma.....	63,815.50	11,805,545.34						5,925,350.20
Oregon.....	9,771.95	7,708,152.53			21.00	315.48		11,805,545.34
South Dakota.....	80,290.45	3,986,691.82			30,254.00	135,446.26		7,779,978.99
Utah.....	11,118.53	7,344,946.32			2,087.85	13,516.19		4,122,138.08
Washington.....	104,966.97	8,014,231.33			1,543,372.49	28,078,872.59		7,358,462.51
Wyoming.....								34,293,221.07
Total.....	705,822.66	108,984,737.45			2,454,168.66	34,117,652.58	40,167.12	143,699,585.67
Proceeds, Federal water-power licenses.....								² 42,008.04
Grand total.....								143,741,593.71

¹ Proceeds for fiscal year, \$5,552.90.² Contra.³ Proceeds for fiscal year, \$10,565.63.

RECLAMATION TABLE 4.—*Consolidated statement, by projects of construction cost of irrigation works, other cost reimbursable with construction, and amount to be repaid by water users*

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance deficits and rearrages and penalties		Construction revenues and contributed funds (contra)		Abandoned works, non-reimbursable cost and authorized charge-offs ¹		Total to be repaid by water users	
	Fiscal year 1928	To June 30, 1928	Fiscal year 1928	To June 30, 1928	Fiscal year 1928	To June 30, 1928	Fiscal year 1928	To June 30, 1928	Fiscal year 1928	To June 30, 1928	Fiscal year 1928	To June 30, 1928
Arizona: Salt River		\$12,744,222.59		\$115,993.50				\$2,312,096.81		\$382,007.31		\$10,166,021.97
California: Yuma	\$28,572.85	9,292,699.14		374,571.27		\$2,921.96	\$5,883.58	190,902.46		\$25,083.46		9,479,289.91
California: Orland	718,655.23	2,245,476.64		2,12,323.99			1,762.21	21,753.11		716,744.52		2,211,399.54
Colorado:												
Grand Valley	10,162.96	4,758,277.95	30,918.43	138,021.28			2,650.78	54,718.89		812,374.64		4,029,805.70
Uncompahgre		6,438,176.91		298,905.54			350.50	24,223.72		47,370.41		6,665,437.92
Idaho:												
American Falls	106,763.45	7,650,030.08		2,504.00			31,858.93	29,067.27				7,620,458.81
Boise	105,435.88	14,497,671.13		90.86		\$863,795.14	82,364.25	332,389.66				15,461,038.40
King Hill	105,435.88	14,497,671.13		90.86		1.35	34.50	28,238.27				1,987,203.04
Minidoka	58,202.40	6,850,036.97		23,743.40			88,770.13	1,658,871.34				2,6,824.33
Minidoka gravity extension												5,728,579.88
Kansas: Garden City	34,088.58	52,923.67						1,000.00				51,923.67
Montana:												
Hundley		342,963.68		52,868.10				61,356.82		334,474.96		
Milk River	66,052.92	1,565,303.59		2,164.63		361.85	170.10	18,111.91		62,049.83		1,548,159.30
Sun River	6,576.85	6,758,308.01		2,907.68		22,650.65	3,978.16	80,952.34		1,911,189.00		5,272,788.29
Montana-North Dakota:	897,646.20	5,525,597.01		2,587.78		18,201.13	1,401.93	43,336.73		913,857.62		5,688,154.26
Lower Yellowstone	83,276.65	3,258,870.01		2,298.96				50.54		382,254.00		3,728,946.13
Nebraska-Wyoming: North Platte	310,830.98	19,133,178.52		71,834.90		1,351,314.42	166,986.63	540,751.11		30,322.30		20,770,072.37
Nevada: Newlands	159,736.49	7,847,749.83		2,503.28		2,633.60	20,405.33	52,346.95		4,437,820.00		3,375,329.49
New Mexico:												
Carlsbad	1,257.00	1,464,522.57		2,131.60		2,16,606.67	606.71	24,953.41		2,665.31		1,424,896.49
Hondo		339,491.68		32,952.01			40.00	656.03		371,787.66		
New Mexico-Texas: Rio Grande	425,397.50	14,735,174.24		22,810.25		2,316,733.31		230,341.47		1,205,675.97		12,982,423.49
North Dakota:												
Buford-Trenton		223,423.06					55,262.63	330,341.47		291,871.26		
Williston		517,630.09						83,181.59		434,283.50		
Oregon:												
Baker	2,955.89	66,317.20						5,000.00				61,317.20
Umatilla	8,158.65	5,165,782.82						30,114.55		2,473,348.21		4,365,425.95
Vale	414,786.17	5,592,183.54		2,11,771.60		30,325.50	168.00	5,000.00		414,786.17		527,183.54
Oregon-California: Klamath	112,005.64	5,376,417.93		1,416.97		3,712.03	20,013.27	307,579.07		7,417.16		5,316,276.08
Oregon-Idaho: Owyhee	727,042.39	9,113,835.21						4,354.61		727,042.39		9,009,480.60
South Dakota: Belle Fourche	58,058.34	3,624,182.75				506,436.99		16,565.35		58,058.34		4,112,065.36

RECLAMATION TABLE 5.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns and other credits and results, calendar year 1927

State and project	Cost	Operation and maintenance returns				Other credits ¹	Results, excess (+) and deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues		
Arizona: Yuma auxiliary.....	\$29,920.92	\$43,010.10			\$1,100.85		+\$14,190.03
Arizona-California: Yuma.....	462,493.14	316,579.44	\$11,844.29	\$6,042.62	10,317.52		—129,794.51
California: Orland.....	30,904.18	35,154.63	299.62	1,309.04	120.75		+3,361.78
Colorado: Uncompahgre.....	132,772.80	2,808.75	3,274.76	75.77	2,575.05		—129,807.51
Utah:							
Boise.....	26,230.85	2,588,173.99	2,31,128.46		2,24,122.63	\$591,231.39	—78,424.54
Boise (drainage).....		2,214,045.93	1.53				—214,044.40
King Hill.....		2,135				1.35	
Mindoka.....	49,073.63	2,224,980.55	124.51		583.11	247,430.32	—25,916.24
Montana:							
Huntley.....	31,932.69	168.62	778.11	28.34	723.81	33,334.83	+3,044.34
Milk River.....	44,382.28	29,875.00		420.00	716.77	64,984.02	+50,773.51
Sun River.....	19,822.82	2,35,638.19	2,335.58	25.86	6,285.08	75,961.51	+26,404.14
Montana-North Dakota: Lower Yellowstone.....	43,502.97	104,123.34			1,498.05	2,32,228.95	+29,889.47
Nebraska-Wyoming: North Platte.....	40,086.67	2,686,834.52	2,79,211.27		1,163.00	892,849.33	+87,879.87
Nevada: Newlands.....	263.58	2,139,915.49	2,243.58	42.12		210,724.07	+70,259.30
New Mexico: Carlsbad.....	45,055.95	42,213.94	1,112.69	1,517.51	2,519.50		—727.33
New Mexico-Texas: Rio Grande.....	341,216.04	303,616.82	2,544.72		35,054.50		
North Dakota: Williston.....	74					74	
Oregon: Umatilla.....	2,130.07	2,87,661.26	24.42	3.59	108.00	17,638.02	—72,024.48
Oregon-California: Klamath.....	75,964.64	90,932.35	138.69	70.45	32,040.27		+47,096.22
South Dakota: Belle Fourche.....	77,292.76	75,000.00			2,121.46		—171.30
Utah: Strawberry Valley.....		2,28,672.99	157.94	71.94		27,825.17	—761.82
Washington:							
Okanogan.....	40,450.90	30,000.00	8.40		374.79		—10,073.71
Yakima.....	264,483.89	252,098.74	9,530.22	6.00	4,078.27	2,798.78	—3,313.06
Wyoming: Shoshone.....	24,140.66	2,122,631.06	2,14,437.18	2,1.10	1,833.83	195,510.27	+36,136.30
Total.....	1,782,122.18	2,808,591.10	2,95,516.17	13,349.76	79,091.98	2,324,555.27	—296,023.94

¹ Amounts to be repaid with construction and charge offs under act of May 25, 1926 (44 Stat. 636).² Contra.

RECLAMATION TABLE 6.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns and other credits, and results to December 31, 1927

State and project	Cost	Operation and maintenance returns				Other credits		Results, excess (+) and deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amounts to be repaid with construction	
Arizona: Yuma auxiliary.....	\$230,694.41	\$260,423.12	\$537.74	\$1,106.79	\$2,936.50	—	—	+\$32,096.16
Arizona-California: Yuma.....	3,433,477.57	3,417,140.69	82,018.64	40,254.40	146,588.50	—	\$2,921.96	+174,937.85
California: Orland.....	351,636.68	381,336.90	813.91	15,725.55	2,410.17	—	—	+17,198.75
Colorado: Uncompahgre.....	688,525.46	566,495.95	14,022.99	11,605.71	12,638.72	—	—	—106,973.51
Idaho:								
Boise.....	2,199,658.77	1,542,457.03	31,157.58	46,526.29	111,044.96	—	600,929.70	+39,404.21
Boise (drainage).....	506,005.16	473,086.84	38,611.62	6,123.43	—	—	—	+169.87
King Hill.....	136,734.25	60,711.27	—	1,519.05	342.89	—	97,199.14	—
Minidoka.....	1,915,975.17	1,544,074.01	29,463.35	22,341.74	99,744.78	—	268,060.44	+3,025.67
Montana:								
Huntley.....	1,014,727.79	563,504.19	15,709.80	10,449.84	11,596.61	—	44,315.73	—390,051.30
Milk River.....	101,043.24	48,678.31	—	617.50	1,818.58	—	64,984.02	+13,820.17
Sun River.....	261,301.69	156,897.69	6,354.93	3,468.33	9,307.80	1 \$34,148.00	58,187.50	+125.90
Montana-North Dakota: Lower Yellowstone.....	1,134,771.45	174,177.59	2.59	4.63	129,025.15	—	861,460.22	+29,889.47
Nebraska-Wyoming: North Platte.....	2,676,622.86	1,775,512.29	31,085.15	35,811.80	28,234.14	—	1,043,332.41	+165,729.33
Nevada: Newlands.....	1,453,190.54	1,190,385.51	28,585.42	24,970.08	26,012.61	1 211,292.00	15,876.45	—6,008.63
New Mexico: Carlsbad.....	1,491,054.11	1,674,239.68	26,583.33	12,958.40	21,083.60	—	1,934.00	+19,848.10
New Mexico-Texas: Rio Grande.....	1,910,215.89	1,824,694.52	5,462.69	4,486.44	84,545.12	—	—	—
North Dakota:								
Butford-Trenton.....	74,781.07	2,317.41	—	—	10.00	2 72,453.66	—	—
Williston.....	904,662.04	34,042.75	45.81	—	489,736.15	2 380,837.33	—	—
Oregon: Umatilla.....	680,347.66	337,365.99	7,775.56	3,314.38	39,809.82	1 91,083.35	117,182.62	—90,444.70
Oregon-California: Klamath.....	931,733.64	901,783.20	3,426.43	4,942.27	51,916.74	—	3,712.03	+24,162.49
South Dakota: Belle Fourche.....	1,311,646.87	863,721.89	31,955.32	9,241.55	18,958.10	—	506,436.99	+100,183.88
Utah: Strawberry Valley.....	437,856.39	377,018.87	9,467.68	11,858.79	20,400.30	—	31,447.25	—11,381.08
Washington:								
Okanogan.....	623,409.84	522,552.51	1,451.15	384.60	70,140.89	—	25,194.37	—4,455.52
Yakima.....	3,553,269.34	3,409,957.80	67,708.89	44,046.37	111,651.39	—	76,603.49	+68,605.86
Wyoming: Shoshone.....	866,979.29	556,838.29	13,710.26	11,052.86	43,303.18	1 21,373.00	215,231.24	—27,556.18
Total.....	28,110,321.18	21,660,034.30	445,950.84	322,810.80	1,533,256.70	811,187.34	4,035,029.56	+52,326.76

1 Charge offs under act of May 25, 1926 (44 Stat. 636).

2 Projects abandoned.

RECLAMATION TABLE 7.—*Accounts receivable, construction water-right charges (including Warren Act contract charges and contributed funds)*

State and project	Due		Collected			Uncollected June 30, 1928
	Fiscal year 1928	To June 30, 1928	Cash		Other credits to June 30, 1928	
			Fiscal year, 1928	To June 30, 1928		
Arizona:						
Salt River-----	\$647,336.87	\$4,243,639.97	\$646,302.57	\$3,597,569.29		\$646,070.68
Yuma auxiliary-----	¹ 112,198.11	700,244.48	¹ 45,922.85	632,481.38	\$4,108.70	63,654.40
Arizona-California: Yuma-----	333,564.94	2,933,668.16	283,231.28	2,589,869.03	244,734.62	99,064.51
California: Orland-----	66,696.99	569,690.77	67,594.52	555,360.86	558.27	13,771.64
Colorado:						
Grand Valley-----	19,995.36	19,995.36	17,224.01	17,224.01		2,771.35
Uncompahgre-----	60,500.62	680,683.33	58,421.66	336,939.77	59,955.03	283,788.53
Idaho:						
American Falls-----		3,345,641.34		3,260,347.57		85,293.77
Boise-----	399,843.05	2,595,764.86	388,353.27	2,554,319.69	25,092.00	16,353.17
King Hill-----		8,025.66		8,025.66		
Minidoka-----	311,149.42	3,983,354.04	266,560.56	3,553,332.54	339,116.93	90,904.57
Minidoka gravity extension-----	1,000.00	1,000.00	1,000.00	1,000.00		
Montana:						
Huntley-----	174.95	440,063.72	5,147.06	439,561.51	502.21	
Sun River-----	2,609.84	178,264.73	5,565.57	177,216.92	479.30	568.51
Montana-North Dakota:-----						
Lower Yellowstone-----	25,353.64	107,944.77	25,382.33	107,944.77		
Nebraska-Wyoming: North Platte-----	81,293.52	2,626,711.24	198,445.93	2,193,753.50	212,903.40	220,054.34
Nevada: Newlands-----	40,271.20	803,608.20	62,883.20	790,111.73	12,566.68	929.79
New Mexico: Carlsbad-----	63,632.91	728,519.86	67,689.89	697,545.29	81.25	30,893.32
New Mexico-Texas: Rio Grande-----	490,000.00	1,683,601.00	308,893.36	1,337,734.80	190,446.64	155,419.56
Oregon:						
Baker-----		5,000.00		5,000.00		
Umatilla-----	36,516.58	447,616.02	27,529.40	419,436.67	314.10	27,865.25
Vale-----	5,000.00	5,000.00	5,000.00	5,000.00		
Oregon-California: Klamath-----	73,933.99	882,906.74	60,307.61	856,576.98		26,329.76
Oregon-Idaho: Owyhee-----	4,354.61	4,354.61	4,354.61	4,354.61		
South Dakota: Belle Fourche-----	5,896.16	802,148.11	5,943.16	484,779.78	266.57	317,101.76
Utah:						
Salt Lake Basin-----	18,569.80	18,569.80	16,085.15	16,085.15		2,484.65
Strawberry Valley-----	110,156.72	880,177.38	129,004.01	873,965.66		6,211.72
Washington:						
Okanogan-----	18,215.19	170,073.12	6,548.30	107,498.91		62,574.21
Yakima-----	388,931.61	5,286,026.97	444,716.80	5,062,506.69	36,047.07	187,473.21
Yakima-Kittitas-----		1,000.00		1,000.00		
Wyoming: Shoshone-----	34,996.37	747,395.76	36,077.21	681,330.89	2,528.58	63,536.29
Total-----	3,127,796.23	34,900,690.00	3,092,338.61	31,367,873.66	² 1,129,701.35	2,403,114.99
Paid in advance of due dates-----			6,065.40	166,350.23	³ 110,038.26	
Refunds-----			1,962.08	48,431.42		
Total collections-----			3,100,366.09	31,582,655.31		

¹ Contra.² Other credits for fiscal year, \$303,790.55.³ Increase for fiscal year, \$53,570.13.

RECLAMATION TABLE 8.—*Accounts receivable, operation and maintenance charges (after public notice)*

State and project	Due		Collected			Uncollected June 30, 1928
	Fiscal year 1928	To June 30, 1928	Cash		Other credits to June 30, 1928	
			Fiscal year 1928	To June 30, 1928		
Arizona: Yuma auxiliary ..	\$38,473.22	\$298,436.29	\$79,216.36	\$238,182.34	\$1,106.79	\$59,147.16
Arizona-California: Yuma ..	303,049.02	2,721,204.55	349,677.31	2,485,177.78	52,145.13	183,881.64
California: Orland	34,965.50	381,114.30	33,858.51	357,289.73	16,987.22	6,837.35
Colorado:						
Grand Valley	48,000.00	48,000.00	45,406.84	45,406.84	438.00	2,155.16
Uncompahgre	181,234.46	748,482.70	72,759.01	466,639.70	30,005.73	251,837.27
Idaho:						
Boise	29,030.80	1,562,626.01	31,083.91	1,515,732.33	46,526.29	367.39
Boise (drainage)	77.35	473,686.84	3.40	467,411.70	6,123.43	151.71
King Hill	1.35	60,711.27		59,192.22	1,519.05	
Minidoka	94,263.95	1,638,337.96	82,081.53	1,550,438.30	83,299.99	4,599.67
Montana:						
Huntley	11,738.34	500,597.13	20,283.23	483,643.07	11,193.03	5,761.03
Milk River	28,906.20	57,009.51	33,975.32	54,043.00	925.00	2,041.51
Sun River	¹ 2,889.02	157,323.40	1,165.28	153,325.80	3,922.62	74.98
Montana-North Dakota:						
Lower Yellowstone	37,075.80	195,685.55	41,215.29	186,865.86	4.63	8,815.06
Nebraska-Wyoming: North						
Platte	38,146.82	1,813,348.44	41,530.42	1,695,334.04	54,254.29	63,760.11
Nevada: Newlands	2,846.07	1,121,041.42	15,666.03	1,077,849.88	38,680.02	4,511.52
New Mexico: Carlsbad	42,244.04	674,289.78	41,504.03	645,548.43	13,188.35	15,553.00
New Mexico-Texas: Rio						
Grande	345,656.21	1,754,131.46	359,041.76	1,715,645.02	4,486.44	34,000.00
North Dakota:						
Buford-Trenton		2,317.41		2,317.41		
Williston		34,042.75		34,042.75		
Oregon: Umatilla	9,746.84	340,437.47	4,653.94	329,633.31	3,314.38	7,489.78
Oregon-California: Klamath						
..	91,016.13	778,218.49	52,617.66	706,771.77	30,536.22	40,910.50
South Dakota: Belle						
Fourche	135,000.00	889,927.27	115,138.24	667,526.74	9,375.99	213,024.54
Utah: Strawberry Valley ..	¹ 1,085.92	376,672.65	3,690.67	364,762.00	11,858.67	51.98
Washington:						
Okanogan	50,845.64	543,090.65	40,334.66	363,138.67	2,653.05	177,298.93
Yakima	244,181.12	3,476,511.61	285,568.79	3,312,307.98	47,102.72	117,100.91
Wyoming: Shoshone	10,498.55	565,459.87	16,534.05	497,753.84	20,336.64	47,369.39
Total	1,772,865.07	21,212,704.78	1,767,006.24	19,475,980.51	² 489,983.68	1,246,740.59
Paid in advance of due						
dates			32,866.68	92,008.53	³ 884.70	
Penalties and interest	12,173.10	451,401.37	25,116.09	437,253.46	⁴ 6,727.07	7,420.84
Refunds			7,333.83	22,026.68	⁵ 156.69	
Total collections			1,832,322.84	20,027,269.18		

¹ Contra.² Other credits for fiscal year, \$29,168.78.³ Increase for fiscal year, \$565.56.⁴ Decrease for fiscal year, \$11,338.49.⁵ Increase for fiscal year, \$98.67.

RECLAMATION TABLE 9.—*Accounts receivable, rentals of irrigation water*

State and project	Due		Collected			Uncollected June 30, 1928
	Fiscal year 1928	To June 30, 1928	Cash		Other credits to June 30, 1928	
			Fiscal year 1928	To June 30, 1928		
Arizona:						
Salt River		\$2, 246, 726. 01		\$2, 246, 726. 01		
Yuma auxiliary	\$1, 448. 85	4, 261. 50	\$1, 251. 15	4, 063. 80		\$197. 70
Arizona-California: Yuma	9, 420. 04	479, 565. 12	4, 876. 49	467, 154. 56	\$10, 869. 64	1, 540. 92
California: Orland	216. 00	121, 266. 00	216. 00	121, 266. 00		
Colorado:						
Grand Valley	1 5, 136. 68	419, 306. 06	1 4, 005. 12	406, 419. 39	6, 500. 67	6, 386. 00
Uncompahgre	3, 268. 44	1, 206, 932. 45	3, 473. 63	1, 182, 673. 92	13, 217. 03	11, 041. 50
Idaho:						
American Falls Reservoir	9, 504. 00	9, 504. 00	9, 504. 00	9, 504. 00		
Boise		749, 685. 57		744, 968. 07	4, 720. 50	
Minidoka	553. 19	275, 267. 09	481. 64	271, 901. 31	3, 253. 83	111. 95
Montana:						
Huntley	403. 06	9, 467. 66	394. 56	9, 432. 00		35. 66
Milk River	1 4, 439. 10	225, 957. 60	3, 525. 11	221, 048. 67	1, 208. 14	3, 700. 79
Sun River	12, 490. 10	116, 252. 47	17, 227. 83	96, 263. 95	1, 204. 81	18, 783. 71
Montana-North Dakota: Lower Yellowstone	1, 566. 34	127, 069. 61	1, 319. 37	126, 822. 64		246. 97
Nebraska-Wyoming: North Platte	1 70, 642. 90	325, 288. 04	1, 192. 00	324, 981. 04	10. 00	297. 00
Nevada: Newlands	503. 28	27, 552. 12	512. 08	21, 375. 27	6, 176. 85	
New Mexico:						
Carlsbad	3, 573. 55	34, 962. 58	3, 573. 55	34, 962. 58		
Hondo		9, 129. 70		9, 129. 70		
New Mexico-Texas: Rio Grande	57, 432. 25	1, 263, 417. 69	5, 858. 75	1, 209, 124. 19		54, 293. 50
North Dakota:						
Buford-Trenton		31. 75		31. 75		
Williston		2, 117. 28		2, 117. 28		
Oregon: Umatilla	11, 879. 60	46, 762. 62	3, 614. 00	38, 497. 02		8, 265. 60
Oregon-California: Klamath	17, 995. 57	101, 673. 21	19, 858. 66	100, 677. 13		996. 08
South Dakota: Belle Fourche	173. 60	7, 082. 74	323. 60	7, 064. 94	17. 80	
Utah: Strawberry Valley		17, 596. 13		17, 596. 13		
Washington:						
Okanogan	266. 40	110, 645. 28	674. 40	108, 061. 09	2, 584. 19	
Yakima	2, 916. 07	156, 710. 51	3, 131. 75	155, 767. 26		943. 25
Wyoming:						
Riverton	1, 054. 96	2, 455. 60	1, 030. 82	2, 392. 46	63. 14	
Shoshone	2, 996. 96	40, 111. 91	2, 984. 84	39, 817. 29	55. 92	238. 70
Total	57, 443. 58	8, 136, 801. 30	81, 019. 11	7, 979, 839. 45	49, 882. 52	107, 079. 33

Contra.

RECLAMATION TABLE 10.—*Voucher transactions, all funds, and net investment as of June 30, 1928*

Fund	Expenditures		Collections		Net investment	
	Fiscal year 1928	To June 30, 1928	Fiscal year 1928	To June 30, 1928	Fiscal year 1928	To June 30, 1928
Reclamation fund.....	\$8, 587, 467. 15	\$224, 237, 943. 55	\$6, 149, 987. 92	\$77, 704, 597. 34	\$2, 437, 479. 23	\$146, 533, 346. 21
Increase of compensation (net).....		2, 797, 960. 33				2, 797, 960. 33
Judgments, Court of Claims.....	2, 190. 00	599, 651. 24			2, 190. 00	599, 651. 24
Rio Grande Dam appropriation (net).....		1, 000, 000. 00				1, 000, 000. 00
Wind River Indian (Riverton) (net).....		359, 176. 04				359, 176. 04
General investigations, Reclamation Service 1923-Dec. 31, 1924 (net).....	117. 50	266, 352. 66			117. 50	266, 352. 66
Yuma auxiliary project fund.....		788, 561. 27	31, 646. 82	917, 323. 10	1 31, 646. 82	1 128, 761. 83
Drainage and cut-over fund (net).....		99, 815. 08				99, 815. 08
Arid, semiarid, swamp and cut-over timberlands (net).....	14, 795. 14	27, 123. 34			14, 795. 14	27, 123. 34
Columbia Basin irrigation project (net).....	6, 875. 37	10, 945. 92			6, 875. 37	10, 945. 92
Colorado River levee system (net).....	25, 552. 54	25, 552. 54			25, 552. 54	25, 552. 54
Total.....	8, 636, 997. 70	230, 213, 081. 97	6, 181, 634. 74	78, 621, 920. 44	2, 455, 362. 96	151, 591, 161. 53

¹ Contra.RECLAMATION TABLES NOS. 11-14.—*Engineering data for projects on completion*

(The following tables of data for projects on completion, covering reservoirs, storage dams, diversion dams, and irrigable area, are necessarily subject to some revision as the projects develop and more detailed plans are prepared. In so far as they refer to works yet to be built or areas not yet covered by canals they are not to be taken as guaranteeing that such work will ever be done. All future work depends on appropriations therefor by Congress)

NO. 11. RESERVOIRS

Projects	Name	Area	Capacity	Spillway			
				Length	Elevation above stream bed	Capacity	
						Normal	Maximum
		<i>Acres</i>	<i>Acre-feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
Arizona: Salt River.....	Roosevelt.....	18, 300	1, 637, 300	378	224	113, 000	150, 000
Do.....	Mormon Flat.....	1, 000	63, 200	243	131		150, 000
Do.....	Horse Mesa.....	2, 600	245, 000	243	243		150, 000
Do.....	Cave Creek flood control.....	760	14, 000	1, 732	59	20, 000	60, 000
California: Orland.....	East Park.....	1, 850	51, 000	415	88	8, 000	12, 000
Do.....	Stony Gorge.....	1, 280	50, 200	90	96	30, 000	50, 000
Colorado: Uncompahgre.....	Taylor Park.....	2, 260	106, 000	(¹)	(¹)	(¹)	(¹)
Idaho:							
Boise.....	Deer Flat.....	9, 835	177, 000	None.			
Do.....	Arrowrock.....	2, 860	280, 000	402	247	15, 000	40, 000
Minidoka.....	Lake Walcott.....	11, 850	150, 000	2, 385	42	40, 000	60, 000
Do.....	Jackson Lake.....	25, 540	847, 000	160	41	7, 500	13, 000
Do.....	American Falls.....	56, 055	1, 700, 000	540	60	60, 000	115, 000

¹ Undetermined.² 95,180 acre-feet only available; above fixed crest of spillway.

RECLAMATION TABLES NOS. 11-14.—*Engineering data for projects on completion—*
Continued

NO. 11. RESERVOIRS—Continued

Projects	Name	Area	Capacity	Spillway			
				Length	Elevation above stream bed	Capacity	
						Normal	Maximum
		<i>Acres</i>	<i>Acre-feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
Montana:							
Milk River.....	Sherburne Lakes.....	2,000	78,000	160	68	³ 200	8,000
Do.....	St. Mary Lakes.....	6,910	124,000	500		20,500	20,000
Do.....	Nelson Reservoir.....	4,560	68,500	(¹)	⁴ 23		
Do.....	Point of Rocks.....	180	830	740	8	³ 0	700
Do.....	Chain Lakes.....	9,400	244,000	³ 300	58	³ 300	10,000
Sun River.....	Willow Creek.....	1,050	16,700	50	62.5		2,000
Do.....	Gibson.....	1,360	105,000	314	170		50,000
Do.....	Pishkun.....	415	3,523	Under control.			
Do.....	Muddy Creek.....	1,828	33,000		80	284	(¹)
Nebraska-Wyoming: North Platte.	Pathfinder.....	22,700	1,070,000	605	184	40,000	
Do.....	Lake Alice.....	900	11,400	100	18	2,500	
Do.....	Lake Minatare.....	2,240	60,760	100	55	2,000	
Do.....	Winters Creek Lake.....	360	3,000	None.			
Do.....	Guernsey.....	2,336	72,700	⁵ 50	45		50,000
Nevada: Newlands.	Lake Tahoe.....	120,000	120,000	⁷ 128	95		30,000
Do.....	Lahontan.....	10,000	⁸ 273,600	85	6	2,500	
New Mexico: Carlsbad.	Avalon.....	970	7,000	500	112	18,800	30,000
Do.....	McMillan.....	6,600	45,000	1,026	21	86,000	120,000
New Mexico-Texas: Rio Grande.	Elephant Butte.....	40,080	2,638,000	1,750	26.1-24.9	34,500	60,000
Oregon: Umatilla.	Cold Springs.....	1,500	50,000	275	193	8,000	16,000
Do.....	McKay.....	1,600	75,000	120	140	6,000	6,000
Oregon-California: Klamath.	Upper Klamath Lake.....	60,000	400,000	None.		10,000	10,000
Do.....	Clear Lake.....	25,000	462,000	357	24	10,000	30,000
Do.....	Gerber.....	3,800	94,000	150	63		10,000
Oregon-Idaho: Owyhee.	Owyhee.....	12,600	715,000	188.5	312	30,000	40,000
South Dakota: Belle Fourche.	Belle Fourche.....	8,010	203,000	314	100	2,000	2,000
Utah:							
Strawberry Valley.	Strawberry Valley.....	8,370	255,000	58	61	500	2,000
Salt Lake Basin	Echo.....	1,470	74,000	72	98		15,000
Washington:							
Okanogan.....	Salmon Lake.....	240	10,500	Siphon.	48		400
Do.....	Conconully.....	460	14,400	180	58	4,500	16,000
Yakima.....	Bumping Lake.....	1,300	34,000	235	36		6,000
Do.....	Lake Cle Elum.....	4,680	501,000	420	112		18,000
Do.....	Lake Kachess.....	4,540	210,000	250	53		7,200
Do.....	Tieton.....	2,500	202,500	390	206		50,000
Do.....	Lake Keechelus.....	2,550	152,000	300	60		10,000
Do.....	Clear Creek.....	270	5,830	261	58		
Wyoming:							
Riverton.....	Pilot Butte.....	882	30,000	100			500
Do.....	Bull Lake.....	3,100	145,000	170	67	4,000	8,000
Shoshone.....	Shoshone.....	6,600	456,600	300	233	11,000	30,000
Do.....	Ralston.....	200	2,100				
Do.....	Deaver.....	80	680	None.			
Total.....		517,828	14,388,323				

¹ Undetermined.³ Average flow of stream on which reservoir is located.⁴ No spillway; drainage limited; elevation is that of water surface.⁵ Consists of 8 siphons each 5 feet high and 10 feet wide at throat.⁶ One 50 by 50 Stoney gate; gate sill 45 feet above river bed.⁷ Two 64 by 14½-foot drum gates; top elevation 95 feet above river bed.⁸ At spillway level; proposed to increase to 290,000 by adding 2 feet by movable crest.

RECLAMATION TABLES NOS. 11-14.—*Engineering data for projects on completion—*
Continued

NO. 12. STORAGE DAMS

Projects	Name	Type	Maximum height	Crest length	Volume
Arizona: Salt River-----	Roosevelt ¹⁰ -----	Rubble masonry arch, gravity.	<i>Feet</i> 280	<i>Feet</i> 1,080	<i>Cubic yards</i> 342,970
Do-----	Mormon Flat ¹⁰ -----	Concrete, variable radius arch.	229	623	42,980
Do-----	Horse Mesa-----	do-----	305	784	147,357
Do-----	Cave Creek flood control. ¹⁰ -----	Reinforced concrete multiple arch.	109	1,680	18,774
California: Orland-----	East Park ¹⁰ -----	Concrete arch, gravity.	139	250	12,200
Do-----	Stony Gorge-----	Ambursen, reinforced concrete.	142.5	868	43,135
Colorado: Uncompahgre-----	Taylor Park-----	Undetermined-----	(¹¹)	(¹¹)	(¹¹)
Idaho:					
Boise-----	Upper Deer Flat ¹⁰ -----	Earth fill-----	70	4,000	1,190,275
Do-----	Lower Deer Flat ¹⁰ -----	do-----	40	7,200	1,207,606
Do-----	Deer Flat Forest ¹⁰ -----	do-----	16	950	22,500
Do-----	Arrowrock ¹⁰ -----	Rubble concrete arch, gravity.	349	1,100	585,130
Minidoka-----	Minidoka ¹⁰ -----	Rock fill, concrete core-----	86	937	242,500
Do-----	Jackson Lake ¹⁰ -----	Massive concrete gate section and earth fill.	67	4,450	345,400
Do-----	American Falls ¹⁰ -----	Earth fill and concrete gravity.	87	{2,100 3,100	150,000 170,000
Montana:					
Milk River-----	Sherburne Lakes ¹² -----	Earth fill-----	83	1,133	201,500
Do-----	St. Mary Lakes-----	do-----	30	2,000	135,000
Do-----	Nelson ¹⁰ -----	do-----	28	9,900	175,000
Do-----	Point of Rocks ¹⁰ -----	do-----	12.5	2,680	31,000
Do-----	Connolly-----	do-----	68	3,125	2,019,000
Sun River-----	Willow Creek-----	do-----	72.5	525	196,400
Do-----	Gibson-----	Concrete arch-----	205	882	160,000
Do-----	Pishkun-----	Earth fill-----	19	2,270	28,474
Do-----	Muddy Creek-----	do-----	90	800	440,000
Nebraska-Wyoming:	Pathfinder ¹⁰ -----	Broken range masonry arch.	218	432	60,210
North Platte.					
Do-----	Pathfinder Dike ¹⁰ -----	Earth fill-----	38	1,650	152,253
Do-----	Upper Lake Alice ¹⁰ -----	do-----	30	3,100	240,000
Do-----	Lower Lake Alice ¹⁰ -----	do-----	23	2,550	119,000
Do-----	Minatare ¹⁰ -----	do-----	65	3,700	570,000
Do-----	Guernsey-----	Sand, gravel, and rock fill.	105	560	561,257
Nevada: Newlands-----	Lake Tahoe ¹⁰ -----	Concrete sluiceway regulator.	14	109	425
Do-----	Lahontan ¹⁰ -----	Earth and gravel fill with concrete spillways.	124	1,400	770,000
New Mexico: Carlsbad-----	Avalon ¹⁰ -----	Earth and rock fill, concrete core.	50	1,380	168,773
Do-----	McMillan ¹⁰ -----	Earth and rock fill-----	55	2,070	150,744
New Mexico-Texas: Rio Grande.	Elephant Butte ¹⁰ -----	Rubble concrete, gravity.	306	¹³ 1,155	¹⁴ 605,200
Do-----	Elephant Butte Dike. ¹⁰ -----	Earth and rock fill-----	42	2,000	¹⁵ 179,000
Oregon: Umatilla-----	Cold Springs ¹⁰ -----	do-----	98	3,800	789,500
Do-----	McKay ¹⁰ -----	Gravel fill with concrete paving.	160	2,600	2,313,000
Oregon-California: Klamath.	Clear Lake ¹⁰ -----	Rock fill-----	33	790	56,600
Do-----	Link River ¹⁰ -----	Concrete-----	22	435	2,200
Do-----	Gerber ¹⁰ -----	Concrete arch-----	85	478	11,900
Oregon-Idaho: Owyhee-----	Owyhee-----	Concrete arch gravity-----	405	835	525,000
South Dakota: Belle Fourche.	Belle Fourche ¹⁰ -----	Earth fill-----	122	6,200	1,600,000
Utah:					
Strawberry Valley-----	Indian Creek Dike ¹⁰ -----	arth fill, reinforced concrete core wall.	38	1,311	101,167
Do-----	Strawberry Dam ¹⁰ -----	do-----	72	488	108,415
Salt Lake Basin-----	Echo-----	Earth and rock fill-----	130	1,900	1,461,000

¹⁰ Completed.¹¹ Not designed.¹² Completed except permanent spillway.¹³ Including spillway and approaches, 1,675 feet.¹⁴ Including spillway, 618,536 cubic yards.¹⁵ Concrete pavement, 5,934 cubic yards.

RECLAMATION TABLES NOS. 11-14.—*Engineering data for projects on completion—*
Continued

NO. 12. STORAGE DAMS—Continued

Projects	Name	Type	Maximum height	Crest length	Volume
			<i>Feet</i>	<i>Feet</i>	<i>Cubic yards</i>
Washington:					
Okanogan	Salmon Lake ¹⁰	Earth embankment	40	1,260	194,288
Do	Conconully ¹⁰	Hydraulic earth fill	67	1,000	354,242
Yakima	Bumping Lake ¹⁰	Earth fill	45	3,425	247,700
Do	Cle Elum ¹⁰	Earth and gravel fill	125	700	462,000
Do	Kachess ¹⁰	Rolled earth and gravel fill	63	1,400	193,300
Do	Tieton ¹⁰	Earth and rock fill, concrete core wall	222	905	1,995,000
Do	Keechelus ¹⁰	Rolled earth and gravel fill	70	6,500	639,000
Do	Clear Creek ¹⁰	Single concrete arch, gravity abutments	84	404	4,100
Wyoming:					
Riverton	Pilot Butte No. 1 ¹⁰	Earth embankment	40	1,350	133,900
Do	Pilot Butte No. 2 ¹⁰	do	24	1,150	50,500
Do	Pilot Butte No. 3 ¹⁰	do	12	3,400	19,200
Do	Bull Lake	do	75	3,300	600,000
Shoshone	Shoshone ¹⁰	Rubble concrete arch	328	200	78,576
Do	Ralston ¹⁰	Earth fill	50	2,200	24,740
Do	Deaver	do	14	1,300	30,300
Total					23,479,691

No. 13. DIVERSION DAMS

Arizona: Salt River	Granite Reef ¹⁰	Rubble concrete weir	38	1,000	40,000
Do	Power Canal ¹⁰	do	12.75	400	8,000
Do	Joint Head ¹⁰	Concrete weir	10	600	1,740
Arizona-California	Laguna ¹⁰	Indian weir, concrete and rock fill	40	4,780	441,732
California: Orland	South Canal ¹⁰	Concrete on piling, with rock fill	20	900	2,886
Do	North Side ¹⁰	Concrete weir, with removable timber crest	8	360	270
Do	East Park Feed Canal ¹⁰	Concrete arch	44	154	1,777
Colorado:					
Grand Valley	Colorado River Diversion ¹⁰	Concrete weir with rolling steel crest	24	546	25,682
Uncompahgre	Gunnison ¹⁰	Crib with rock fill and movable flashboards	15.75	237	3,200
Do	Montrose and Delta ¹⁰	Timber weir with concrete apron sluiceway and cut-off wall	6.8	68.5	172
Do	Loutsenhizer ¹⁰	Pile and timber weir	8	100	
Do	Selig ¹⁰	Pile and timber weir with concrete sump	6	95.5	205
Do	Ironstone ¹⁰	Pile foundation with timber deck and needle flashboards	8.5	58.5	
Do	East Canal ¹⁰	Pile and timber weirs, movable flashboards: (17)		144	
Do	Garnet ¹⁰	Rock baskets, faced and surfaced with concrete	6.5	75	500
Idaho:					
Boise	Boise River ¹⁰	Rubble concrete weir	45	18,246	21,750
Do	Black Canyon ¹⁰	Concrete masonry	183	1,040	79,844
Minidoka	Minidoka ¹⁰	Combined diversion and storage dam (see Storage).			

¹⁰ Completed.¹⁶ Present development, rock-fill timber crib; height, 11 feet; volume, 1,500 cubic yards.¹⁷ Two weirs, one 6 feet by 72 feet, the other 6 feet 10 inches by 72 feet.

RECLAMATION TABLES NOS. 11-14.—*Engineering data for projects on completion—*
Continued

No. 13. DIVERSION DAMS—Continued

Projects	Name	Type	Maximum height	Crest length	Volume
Montana:			<i>Feet</i>	<i>Feet</i>	<i>Cubic yards</i>
Milk River.....	Swift Current ¹⁰ ...	Earth and rock fill timber crib.	13	2,800	86,700
Do.....	St. Mary ¹⁰	Concrete.....	6.5	198	480
Do.....	Chinook ¹⁹				
Do.....	Dodson ¹⁰	Timber crib rock filled, concrete abutments, movable crest.	25	319	12,000
Do.....	Vandalia ¹⁰	Hollow reinforced concrete, automatic movable crest.	34	1,500	11,000
Sun River.....	Sun River ¹⁰	Arched concrete masonry.	132	212	6,200
Montana-North Dakota:	Lower Yellowstone ¹⁰	Rock-filled timber weir.	12	700	14,500
Lower Yellowstone.	Whalen ¹⁰	Concrete weir with earth earth abutments.	35	300	144,862
Nebraska-Wyoming:	Horse Creek ¹⁰	do.....	6	118	4,960
North Platte.	Truckee River ¹⁰	16 concrete sluiceways.....	22	171	3,322
Do.....	Carson River ¹⁰	23 concrete sluiceways.....	20	240	2,707
Nevada: Newlands.	Spanish Springs.....	Concrete overflow.....	22	250	2,140
Do.....	Avalon ¹⁰	Combined storage and diversion (see Storage).			
New Mexico: Carlsbad.	Leasburg ¹⁰	Rubble concrete weir.....	10.8	600	2,644
New Mexico-Texas: Rio Grande.	Mesilla Park ¹⁰	do.....	16.7	303	2,876
Do.....	Mexican ²⁰	Rubble masonry.....	4.7	320	1,200
Do.....	Percha ¹⁰	Rubble concrete.....	17	350	4,346
Oregon:					
Umatilla.....	Feed Canal (Echo) ¹⁰	Concrete weir on timber crib.	2.5	400	296
Do.....	Maxwell Canal ¹⁰	do.....	2.3	175	43
Do.....	Three-Mile Falls ¹⁰	Concrete multiple arch.	24	800	4,160
Vale.....	Harper.....	{Concrete gravity with earth and rock fill embankment.	30	700	{1,570 8,000
Oregon-California: Klamath.	Lost River ¹⁰	Hollow reinforced concrete.	40	290	5,550
Do.....	Lower Lost River ¹⁰	Reinforced concrete.....	15	204	625
Do.....	Malone ¹⁰	Earth, with concrete spillway.	30	515	18,500
Do.....	Miller ¹⁰	do.....	12	290	1,000
South Dakota: Belle Fourche.	Diversion ¹⁰	Concrete weir.....	23	400	12,149
Utah:					
Strawberry Valley.....	Spanish Fork ¹⁰	Reinforced concrete, ogee gravity section.	17	70	1,262
Do.....	Indian Creek Crossing ¹⁰	Earth fill with clay-filled cut-off trench.	17	1,300	15,183
Salt Lake Basin.....	Weber-Provo.....	Closed concrete weir and dike.	20	150	(¹¹)
Washington:					
Okanogan.....	Salmon Creek ¹⁰	Concrete weir.....	4	50	132
Yakima.....	Sunnyside ¹⁰	Concrete ogee weir, earth dike.	8.5	500	2,291
Do.....	Tieton Diversion ¹⁰	Concrete weir and rock-filled crib.	3	110	334
Do.....	Easton.....	Concrete gravity, with ogee river section.	65	248	5,500
Wyoming:					
Riverton.....	Wind River ¹⁰	Concrete weir with earth embankment.	37	2,285	123,850
Shoshone.....	Corbett ¹⁰	Reinforced concrete weir.....	18	400	4,951
Do.....	Willwood ¹⁰	Concrete gravity, with ogee weir section.	69.5	320	22,119
Total.....					1,155,210

¹⁰ Completed.¹¹ Not designed.¹⁹ Will be constructed by irrigation districts. No data available as to type and dimensions.²⁰ Constructed by Mexican authorities and used jointly.

RECLAMATION TABLES NOS. 11-14.—*Engineering data for projects on completion—*
Continued

NO. 14. IRRIGABLE AREA, PRESENT STATUS

State, project, and division	Public land			State land unsold	Indian land	Private land		Total
	Entered	Open	With-drawn			Rail-road unsold	Other	
Arizona:	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Salt River.....	20, 571						219, 629	240, 200
Gravity system.....	13, 412						219, 629	233, 041
Pumping system.....	7, 159							7, 159
Arizona-California: Yuma.....	14, 632	3, 504	34, 274		8, 325		51, 337	112, 072
Arizona—								
Valley.....	5, 829		1, 875		110		44, 340	52, 154
Mesa.....	2, 815	3, 504	31, 884				6, 797	45, 000
California—Reservation.....	5, 988		515		8, 215		200	14, 918
California: Orland—Main.....							²¹ 20, 733	²¹ 20, 733
Colorado:								
Grand Valley.....	13, 530	361	8, 494				28, 115	50, 500
Garfield gravity.....	11, 530	361	4, 994				15, 115	32, 000
Garfield pumping.....	2, 000		3, 500				3, 000	8, 500
Orchard Mesa pump- ing.....							10, 000	10, 000
Uncompahgre.....	13, 144	1, 429					61, 211	75, 784
Idaho:								
Boise.....	69, 468		17, 320	6, 850			251, 860	345, 498
Arrowrock (Idaho).....	65, 892			60			203, 869	269, 821
Arrowrock (Oregon).....	1, 206						5, 697	6, 903
Notus.....							6, 874	6, 874
Hillcrest.....	1, 000		2, 000	1, 000			10, 100	14, 100
Black Canyon.....	1, 370		15, 320	5, 790			25, 320	47, 800
King Hill.....				335			16, 553	16, 888
Minidoka.....	96, 080	618	146, 840	9, 224			63, 471	316, 233
Pumping.....	30, 258			1, 013			17, 689	48, 960
Gravity.....	65, 822	618		371			5, 782	72, 593
North side pumping extension.....			106, 840	7, 840				114, 680
Gravity extension unit.....			40, 000				40, 000	80, 000
Montana:								
Huntley.....	26, 213		2, 553		244		3, 497	32, 507
Gravity.....	21, 272		2, 007		244		3, 497	27, 020
Pumping.....	4, 941		546					5, 487
Divisions—								
Fryor.....	23, 549		1, 889		66		2, 912	28, 416
Eastern.....	925		42		178		585	1, 730
Fly Creek.....	1, 739		622					2, 361
Milk River.....	28, 940		14, 425	5, 541			94, 382	143, 288
Chinook division ²²	1, 941		1, 608	1, 198			50, 753	55, 500
Malta division.....	21, 273		12, 365	3, 280			28, 737	65, 655
Glasgow division.....	5, 726		452	1, 063			14, 892	22, 133
Sun River.....	38, 113		34, 555	5, 182			28, 992	106, 842
Sun River Slope.....	655		13, 341	969			3, 213	18, 178
Big Coulee.....				356			1, 934	2, 290
Greenfields.....	22, 071		18, 768	3, 640			20, 184	64, 663
Mill Coulee.....	4, 197		1, 543				2, 160	7, 900
Fort Shaw.....	11, 190		903	217			1, 501	13, 811
Montana-North Dakota:								
Lower Yellowstone.....	9, 869		2, 169	798		211	46, 302	59, 349
Montana.....	4, 625		1, 086	658		211	32, 448	39, 028
North Dakota.....	5, 244		1, 083	140			13, 854	20, 321
Divisions—								
Gravity.....	9, 708		2, 169	565		203	44, 396	57, 041
Pumping.....	161			233		8	1, 906	2, 308
Nebraska-Wyoming:								
North Platte.....	56, 777		4, 420	3, 463			172, 697	237, 357
Interstate division.....	10, 793		2, 424	644			100, 589	114, 450
Nebraska.....	10, 042		2, 239	614			98, 635	111, 560
Wyoming.....	751		185				1, 954	2, 890
Fort Laramie division.....	38, 298		1, 996	2, 780			63, 659	106, 733
Nebraska.....	15, 420		489	246			39, 073	55, 228
Wyoming.....	22, 878		1, 507	2, 534			8, 449	51, 505
Newport division— Nebraska.....	7, 686			39			8, 449	16, 174
Nevada:								
Newlands.....	29, 308	554	17, 512		4, 877	7, 500	30, 249	90, 000
Carson division.....	25, 827	433	12, 114		4, 877	2, 500	27, 249	73, 000
Truckee division.....	3, 481	121	5, 398			5, 000	3, 000	17, 000
New Mexico: Carlsbad.....	45						25, 010	25, 055

²¹ Includes 416 acres of vested rights and 170 acres of school and town sites²² Includes Savoy unit previously excluded.

RECLAMATION TABLES NOS. 11-14.—*Engineering data for projects on completion—*
Continued

NO. 14. IRRIGABLE AREA, PRESENT STATUS—Continued

State, project, and division	Public land			State land unsold	Indian land	Private land		Total
	Entered	Open	With-drawn			Rail-road unsold	Other	
New Mexico-Texas:	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Rio Grande.....	550			200			154,250	155,000
New Mexico.....	550			200			87,250	88,000
Texas.....							67,000	67,000
Divisions—								
Rincon.....				50			16,950	17,000
Leasburg.....	300			100			32,600	33,000
Mesilla.....	250			50			47,700	48,000
El Paso.....							57,000	57,000
Oregon:								
Umatilla.....	2,383		2,376			3,319	14,353	22,431
East division.....						1,407	9,724	11,131
West division.....	2,383		2,376			1,912	4,629	11,300
Vale.....			3,700				27,300	31,000
Oregon-California: Klamath.....	13,913	405	20,982				141,449	176,749
Oregon.....	3,981						104,106	108,087
California.....	9,932	405	20,982				37,343	68,662
Divisions—								
Main.....	2,536						39,221	41,757
Tule Lake.....	11,377	405	20,982				236	33,000
Pumping.....							20,595	20,595
Langell Valley.....							21,497	21,497
Bonanza Springs.....							5,900	5,900
Lower Klamath Lake.....							²³ 54,000	54,000
Oregon-Idaho: Owyhee.....	27,000		7,000	3,000			85,000	122,000
Idaho, complete supply.....	3,000		7,000				35,000	45,000
Oregon—								
Complete supply.....	24,000			3,000			38,000	65,000
Supplemental right.....							12,000	12,000
South Dakota: Belle Fourche.....	36,312		4,508	1,820			38,670	81,310
Utah:								
Strawberry Valley.....	2,003						51,886	53,889
High Line.....	2,003						19,853	21,856
Spanish Fork.....							22,033	22,033
Springville-Mapleton.....							10,000	10,000
Salt Lake Basin.....							80,000	80,000
Washington:								
Okanogan.....	116						7,184	7,300
Gravity.....								6,125
Pumping.....								1,175
Yakima.....	7,358		14,231	6,494	241	24,522	288,854	341,700
Sunnyside.....	2,627			30	241		104,702	107,600
Tieton.....	2,048			4			29,948	32,000
Kittitas.....			5,533	1,961		6,729	57,777	72,000
Roza.....	120		1,523	2,067		11,310	43,330	58,350
Moxee.....	1,663		775	1,332		2,783	30,197	36,750
Kennewick.....	900		6,400	1,100		3,700	22,900	35,000
Wyoming:								
Riverton.....			69,000		1,000		30,000	100,000
Shoshone.....	53,895	13,298	110,989	3,880		7,027	14,078	203,167
Montana, Frannie division.....			86	4				90
Wyoming—								
Garland division.....	37,429	728	1,290	252			2,362	²⁴ 42,061
Frannie division.....	14,272	1,143	10,264	311		356	1,564	27,910
Willwood division.....	1,976	1,164	8,180	282			330	11,932
Heart Mountain division.....	218	10,263	38,582	1,958		6,671	9,822	²⁵ 67,514
Oregon Basin division.....			52,587	1,073				53,660
Total.....	560,220	20,169	515,348	46,787	14,687	42,579	2,047,062	3,246,852

²³ Includes some public land, but distribution not known.²⁴ Increase from 41,923 acres reported in twenty-fifth annual report is class-6 land for which owners have not accepted adjustment.²⁵ Increase from previous report due to inclusion of lands in Chapman Bench and Polecat Bench.

RECLAMATION TABLE 15.—Summary of construction results to June 30, 1928

Items	To June 30, 1928	To June 30, 1927	Increase
Reservoir capacity available (original).....	<i>Acre-feet</i> 12, 829, 523	<i>Acre-feet</i> 12, 556, 653	<i>Acre-feet</i> 272, 870
CANALS, DITCHES, AND DRAINS			
	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>
Canals over 800 second-feet capacity.....	546. 5	521. 6	24. 9
Canals 301 to 800 second-feet capacity.....	725. 8	718. 2	7. 6
Canals 50 to 300 second-feet capacity.....	2, 324. 3	2, 323. 4	0. 9
Canals less than 50 second-feet capacity.....	9, 486. 7	9, 470. 2	16. 5
Total canals.....	13, 083. 3	13, 033. 4	49. 9
Waste-water ditches.....	1, 061. 2	1, 056. 3	4. 9
Drains, open.....	2, 042. 4	1, 850. 6	191. 8
Drains, closed.....	225. 8	215. 7	10. 1
Total.....	3, 329. 4	3, 122. 6	206. 8
Grand total.....	16, 412. 7	16, 156. 0	256. 7
TUNNELS			
Number.....	118	110	8
Length (feet).....	164, 083	155, 172	8, 911
STORAGE AND DIVERSION DAMS			
	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
Masonry.....	2, 716, 103	2, 609, 387	106, 716
Earth.....	16, 092, 473	15, 699, 809	392, 664
Rock-fill and crib.....	2, 074, 733	1, 897, 155	177, 578
Total.....	20, 883, 309	20, 206, 351	676, 958

Items	To June 30, 1928		To June 30, 1927		Increase	
DIKES AND LEVEES						
Length and volume.....	<i>Feet</i> 1, 294, 122	<i>Cu. yds.</i> 6, 717, 369	<i>Feet</i> 1, 138, 109	<i>Cu. yds.</i> 5, 911, 568	<i>Feet</i> 156, 013	<i>Cu. yds.</i> 805, 801
	Concrete	Wood	Concrete	Wood	Concrete	Wood
CANAL STRUCTURES						
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
Costing over \$2,000.....	1, 540	242	1, 518	237	22	5.
Costing \$500 to \$2,000.....	3, 465	1, 052	3, 394	1, 033	71	19
Costing \$100 to \$500.....	18, 520	11, 182	18, 302	10, 965	218	217
Costing less than \$100.....	32, 353	77, 810	32, 097	77, 748	256	62
Total.....	55, 878	90, 286	55, 311	89, 983	567	303
Grand total.....	146, 164		145, 294		870	
	Number	Length	Number	Length	Number	Length
BRIDGES						
		<i>Feet</i>		<i>Feet</i>		<i>Feet</i>
Steel.....	112	9, 124	112	9, 124	0	0.
Combination.....	434	13, 020	430	12, 963	4	57
Wood.....	10, 390	242, 091	10, 242	235, 323	148	6, 768
Concrete.....	396	5, 285	390	5, 216	6	69
Total.....	11, 332	269, 520	11, 174	262, 626	158	6, 894
CULVERTS						
Concrete.....	3, 720	194, 078	3, 597	181, 734	123	12, 344
Metal.....	3, 211	114, 289	2, 924	100, 524	287	13, 765
Terra cotta.....	2, 115	84, 048	2, 097	83, 010	18	1, 038
Wood.....	4, 475	117, 364	4, 307	111, 636	168	5, 728
Total.....	13, 521	509, 779	12, 925	476, 904	596	32, 875

RECLAMATION TABLE 15.—*Summary of construction results to June 30, 1928—*
Continued

Items	To June 30, 1928		To June 30, 1927		Increase	
PIPE						
Concrete.....	<i>Linear feet</i> 1,062,079		<i>Linear feet</i> 1,040,138		<i>Linear feet</i> 21,941	
Metal.....	401,601		372,737		28,864	
Terra cotta (tile).....	1,757,788		1,646,606		111,182	
Wood.....	709,842		700,319		9,523	
Total.....	3,931,310		3,759,800		171,510	
FLUMES						
Concrete.....	Number	Length	Number	Length	Number	Length
Metal.....		<i>Feet</i>		<i>Feet</i>		<i>Feet</i>
Wood.....	104	73,448	103	73,348	1	100
	1,897	234,643	1,767	229,250	130	5,393
	2,692	534,838	2,680	533,982	12	856
Total.....	4,693	842,929	4,550	836,580	143	6,349
CANALS LINED						
Length.....	Concrete	Wood	Concrete	Wood	Concrete	Wood
	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>
	470.8	4.1	464.6	4.1	6.2	0.0
Total.....	474.9		468.7		6.2	
BUILDINGS						
Offices.....	<i>Number</i>		<i>Number</i>		<i>Number</i>	
Residences.....	101		101		0	
Power plants.....	731		731		0	
Pumping stations.....	35		35		0	
Barns, storehouses, etc.....	236		230		6	
	575		575		0	
Total.....	1,678		1,672		6	
WELLS						
Number and depth.....	Number	Depth	Number	Depth	Number	Depth
		<i>Feet</i>		<i>Feet</i>		<i>Feet</i>
	688	72,853	685	72,579	3	274
COMMUNICATIONS						
Roads.....	<i>Miles</i>		<i>Miles</i>		<i>Miles</i>	
Railroads.....	1,089.5		1,084.8		4.7	
Telephone lines.....	87.9		83.0		4.9	
Transmission lines.....	3,350.3		3,350.3		0.0	
	1,914.9		1,761.5		153.4	
Total.....	6,442.6		6,279.6		163.0	
POWER DEVELOPED						
Water and steam.....	<i>Horsepower</i>		<i>Horsepower</i>		<i>Horsepower</i>	
	166,103		155,903		10,200	
EXCAVATION						
Class 1, earth.....	<i>Cubic yards</i>		<i>Cubic yards</i>		<i>Cubic yards</i>	
Class 2, indurated material.....	240,665,663		232,342,336		8,323,327	
Class 3, rock.....	14,482,633		13,096,417		1,386,216	
	11,677,836		10,987,505		690,331	
Total.....	266,826,132		256,426,258		10,399,874	
Riprap (cubic yards).....	2,515,400		2,495,049		20,351	
Paving (square yards).....	1,068,994		1,057,143		11,851	
Concrete (cubic yards).....	4,011,800		3,851,073		160,727	
Cement (barrels).....	4,429,427		4,255,307		174,120	
Gunitite (square yards).....	754,868		754,868		0	

RECLAMATION TABLE 16.—Power plants operated on Bureau of Reclamation projects during fiscal year 1927-28

Project	Name of plant	Outgoing line voltage	Plant capacity (kv-a)	Number of units	Head in feet	First cost of plant	Cost of operation and maintenance	Estimated depreciation	Cost per kilowatt-hour, exclusive of depreciation	Distribution of kilowatt-hours generated				Total output, kilowatt-hour	Gross power sales
										Sold to consumers	Irrigation and drainage requirements	Used for other purposes	Losses		
Boise	Black Canyon 1	\$ 66,000	10,000	2	82-92	\$414,317.21	\$11,918.00	\$14,501.00	0.000221	{Entire output delivered to Idaho Power Co. Entire output leased to Idaho Power Co. 20,384,789/28,631,474/108,769/2,578,672 {Distribution included with Minidoka power plant. 6,406,148				53,919,494	\$48,677.32
Minidoka	Boise River 2	22,000	1,875	3	25-30	167,905.37	235.36	3,000.00	.01					23,800	4,000.00
	Minidoka	33,000	10,000	6	47	645,403.41	37,556.03	20,400.00	.00072					51,696,504	125,872.85
Newlands 7	American Falls (2 plants) 2	33,000	1,540	3	36 and 45	\$76,975.00	\$ 6,070.57							7,200	
	Lahontan 3	33,000	1,875	3	105 and 110	141,886.01		4,200.00						6,496,770	22,985.48
North Platte	Guernsey	33,000	6,000	2	Variable	\$440,933.21	\$63,947.81	45,800.00	.0029					\$15,140,481	182,133.88
	Lingle	33,000	1,750	4	107	186,693.34									
Okanogan	Power Plant No. 1	6,600	187	1	108	11,923.44									
	Power Plant No. 2	6,600	187	1	55	13,931.42									
Rio Grande	Elephant Butte No. 2	2,300	150	1	18-180	8,440.50	2,033.65	253.00	.04					50,440	
	Pilot Butte	33,000	1,000	1	103	153,804.03	22,162.15	2,761.33	.0253					875,280	11,103.01
Salt River 1	Arizona Falls	\$ 11,000	1,060	2	19	109,500.73	11,893.80	5,475.00	.00391					3,038,475	
	Chandler	11,000	1,600	1	40	91,990.84	8,797.90	4,600.00	.00342					2,573,610	
	Crosscut	\$ 11,000	5,250	6	111	755,147.29	27,412.38	37,750.00	.00224					12,262,000	
		and 40,000													
	Roosevelt	110,000	19,250	7	80-240	1,235,894.58	58,318.16	61,850.00	.000895					65,149,062	2,157,940.91
	So. Consolidated	40,000	2,000	2	34	163,139.60	10,791.72	8,160.00	.00134					8,042,300	
	Mormon Flats	110,000	8,750	1	60-150	482,767.80	13,503.03	24,130.00	.000362					37,255,000	
	Horse Mesa	110,000	33,000	3	265.5	341,896.54	56,742.90	267,000.00	.000435					128,770,000	
Shoshone	Shoshone	33,000	2,000	2	225	567,698.96	9,788.00	16,914.00	.00376					193,459	597,037
	Spanish Fork	11,000	1,000	2	123.5	60,904.80	14,803.20	3,045.00	.0078					189,898	132,884
Yakima Valley 7	Rocky Ford	6,600	187	1	73	23,000.00	2,521.87	1,056.40	.00397					634,800	
	Sunny Side 7														
Yuma	Siphon Drop	33,000	2,000	2	9.37	319,425.00	\$17,775.00	\$11,700.00	.00295					\$*6,137,575	\$*8,292.29

¹ Operated entire fiscal year.
² Operated for stand-by service only.
³ Includes \$5,716.26 rental charges.
⁴ Leased to Canyon Power Co. for 10-year period.
⁵ Cost not final.
⁶ Includes purchased power.
⁷ Operated by irrigation district or association.
⁸ Includes 158,640 kilowatt-hours generated by Springville plant.
⁹ Includes 115,241 kilowatt-hours purchased.
^a Estimated.
^b 11,000 volt generators.
^c 6,600 volt generators; all others 2,300 volts.

RECLAMATION TABLE 17.—Pumping plants operated on Bureau of Reclamation projects during fiscal year 1927-28

Project	Name of plant	Type of units	Plant capacity		Num-ber of units	Static lift (feet)	First cost of plant	Cost of operation and maintenance	Esti-mated depre-ciation	Energy used for pumping (kilowatt hours)	Acre-feet pumped	Cost per acre-foot without depreciation	
			Horse-power	Second-foot								Per acre-foot	Per foot lift
Boise	Black Canyon.	V. T. D. S.	1,244	266	2	28.7	\$149,901.39	\$1,375.30	7,495.07		90,318	0.015	0.00653
	Price Sub.	V. T. D. C.	125	25	1	31	46,697.83	460.00	1,000.00		5,100	.09	.0029
	Grand Valley	V. T. D. C.	620	60	2	45	73,833.32						
	Huntley	O. E. D. C.	400	46	2	45	71,103.56						
	Ballantine auxiliary	V. T. D. C.	75	19.3	1	51.0	31,861.11	136.20	1,200.00		2,060	.066	.0013
Klamath	Dry Lake	V. M. D. S.	120	60	2	5.27	23,717.70	3,193.44	1,000.00		15,431	.207	.0393
	Tule Lake No. 1.	V. M. D. S.	25	12	1	5.27							
	Tule Lake No. 2.	V. M. D. S.	60	25	1	13							
	Tule Lake No. 3 ²	V. M. D. S.	220	45	2	31	49,970.43	259.53	1,000.00			.059	.0019
	Thomas Point.	H. T. D. C.	3,800	825	5	29.3	186,023.00			11,295,417	242,309		
Lower Yellowstone	Pumping station No. 1	V. M. D. C.	3,280	693	4	31.1	184,920.00	339,467.06	7,700.00	10,116,968	203,280	.0095	.0023
	Pumping station No. 2	V. M. D. C.	1,900	417	3	23.7	103,107.00			6,020,200	122,273		
	Pumping station No. 3	V. M. D. C.	200	50	2	20	32,947.72			1,600.00	18,721		
	Boersch Lake	V. M. D. C.	150	40	2	21.25	18,745.61			498,940	10,995		
	West End.	H. M. D. C.	25	20	1	3.5	3,328.43			35,745			
Newlands	A-4 pumping station	Scoop wheel.	10	11	1	2.5	3,634.71			270.00	10,920		
	1817 pumping station	do.	7.5	4	1	2.5		39,452.17					
	C-2 pumping station	H. M. D. C.	7.5	2	1	7	2,803.97			11,005			
	114 pumping station	H. M. D. C.	7.5	2	1	4	1,008.76			60.00			
	1812 pumping station	H. M. D. C.	7.5	2	1	4	1,864.77			7,948			
North Platte	Macrae pumping station	H. M. D. C.	15	4	1	14	1,696.56			19,840			
	D-2 pumping station	H. M. D. C.	45	16.5	3	13							
	Three drainage pumping plants ²	H. M. D. C.	400	60	2	54.1	36,289.62						
	Lahontan	H. M. D. C.			3			Not oper-ated.					
	Dutch flat drainage pumps.	V. M. D. C.	100	8	3	30-52	23,393.94		1,500.00	110,900	664.31	3.04	.008
Okanagan	Duck Lake	H. M. D. C.	125	10	2	52-77	17,201.92			230,933	1,490	2.20	.034
	Government wells Nos. 1 and 2	V. M. D. C.	30	2	2	51.25	18,388.21				10,321	40	.135
	Robinson Flat.	H. M. D. C.	400	12	2	177	30,077.24			518,029	1,450	5.37	.030
	Salmon Lake.	G. E. D. C.	275	18	1	27-60	17,842.16						
	Not oper-ated.												
Salt River	Heard pumping plant.	H. Steam											
	Dobbins pumping plant.	V. M. D. C.	75	4	1	68.3		64.21			77	.834	.0122
	Chandler division.	H. M. D. C. & V. M. D. S.	820	91.96	11	40.75	148,084.21	30,016.02	10,365.89	2,032,370	25,716	1.17	.023
	High Line.	H. M. D. C.	900	105	4	50	66,656.83			2,386,299	4,436	6.94	.139
	Tempe pumping plant	H. M. D. C.	150	13	1	50		8,131.83		558,791	4,849	1.68	.0335

¹ Operated by districts.² Under construction during fiscal year.³ Without district overhead.⁴ Built by district.⁵ Cost of electricity not included.

RECLAMATION TABLE 17.—Pumping plants operated on Bureau of Reclamation projects during fiscal year 1927-28—Continued

Project	Name of plant	Type of units	Plant capacity		Num-ber of units	Static lift (feet)	First cost of plant	Cost of operation and maintenance	Esti-mated depreciation	Energy used for pumping (kilowatt hours)	Acre-feet pumped	Cost per acre-foot without depreciation	
			Horse-power	Second-foot								Per acre-foot	Per foot lift
Salt River-----	Mesa division-----	V. M. D. C. & S.	2,030	185.17	25	49.78	\$205,192.63	\$68,039.30	\$14,363.48	5,405,501	56,567	1.20	0.024
	Laveen division-----	V. M. D. C. & S.	55	3.2	3	52.44	18,328.45	9,370.37	1,282.99	295,664	1,926	4.86	.097
	Phoenix division-----	V. M. D. C.	1,970	113.59	48	66.85	253,460.40	89,430.70	17,742.23	5,620,842	41,123	2.17	.0325
	Tempe division-----	H. & V. M. D. S.	1,480	165.14	20	42.81	130,323.80	75,730.60	9,122.66	5,212,130	66,649	1.14	.0265
	Salt River division-----	V. M. D. C.	1,300	160.16	25	34.38	51,988.06	57,208.92	3,639.16	3,752,763	54,790	1.04	.0304
	San Francisco-----	H. M. D. C. & S.	50	3	1	50	29,978.90	2,602.97	2,997.89	158,837	844	3.08	.062
	Tolleson division-----	V. M. D. C. & S.	755	64.94	621	39.03	91,045.39	18,004.06	6,373.18	1,240,415	14,373	1.25	.032
	Maricopa Garden-----	V. M. D. C.	75	12	1	27.33	12,444.24	2,352.33	871.10	206,353	3,312	.71	.026
	New States Canal-----	H. M. D. C.	125	15	1	25	9,053.72	1,179.30	633.76	81,630	592	1.99	.0796
	Joint Head booster pump-----	H. M. D. C.	250	100	2	20	23,000.00	1,642.14	1,610.00	42,982	394	1.63	.0815
Yakima-Sunny-side. ¹	Fifteenth Avenue booster pump-----	H. M. D. C.	8	4	2	8	1,000.00	123.15	70.00	9,880			
	Grandview-----	V. T. D. C.	365	36.5	3	35 & 78	72,500.00	2,783.90	3,120.00		11,565	.241	.0037
	Hillcrest-----	2 H. M. D. C.	35	1.56	1	103	5,800.00	198.50	300.00		348	.57	.0055
	Little Snipes Mountain-----	V. T. D. C.	5	0.33	1	50	1,062.00	78.00	68.71		86	.91	.0181
	Outlook-----	V. T. D. C.	800	48	2	110	92,000.00	3,185.74	2,480.00		15,126	.21	.0019
	Prosser-----	H. T. D. C.	190	12	1	105	31,988.23	1,496.23	1,500.00		3,340.5	.45	.0043
	Spring Creek-----	H. T. D. C.	160	11.6	1	90	28,056.00	1,372.17	1,500.00		3,747.5	.37	.0041
	Snipes Mountain-----	V. T. D. C.	850	22	3	200	78,000.00	2,323.50	1,890.00		6,060	.38	.0019
	B-Lift-----	V. M. D. C.	1,100	105	3	71.25	159,936.24	*11,900.00	5,413.00	*614,000	*4,350	2.74	.0348
	Reservation-----	2 H. M. D. C.	130	56	2	3.79	6,775.00	*2,650.00	325.00	*8,689	*2,914	.91	.24
Yuma-----	Valley drainage-----	{ O. F. D. S. } { 2 H. M. D. S. }	525	300	3	11.15	108,770.00	*17,000.00	4,219.00	{ *747,382 } { *8,400 } { *2,330 }	{ *52,048 } { }	.327	.029
	West Yuma-----	H. M. D. C.	20	4.6	1	7	1,800.00	*925.00	90.00	{ }	{ *93.7 }	9.87	1.41

¹ Operated by districts.⁷ Gallons of oil.⁸ Gallons of gasoline.^{*} Estimated.

RECLAMATION TABLE 18.—*Settlement and economic data, 1927*

State and project	Irrigated farms		Towns		Number of schools	Number of churches
	Number	Population	Number	Population		
Arizona: Salt River.....	7,500	46,000	12	70,000	70	68
Arizona-California: Yuma.....	1,369	3,526	5	10,000	14	24
California: Orland.....	698	1,841	1	1,840	10	8
Colorado:						
Grand Valley.....	427	1,165	6	15,040	24	32
Uncompahgre.....	1,768	5,959	3	7,400	27	27
Idaho:						
Boise.....	3,814	10,500	16	45,705	55	78
King Hill.....	182	580	3	1,337	6	5
Minidoka.....	2,219	7,091	6	7,950	23	40
Montana:						
Huntley.....	584	1,503	5	570	8	8
Milk River.....	285	904	17	8,419	32	34
Sun River.....	328	744	4	349	10	9
Montana-North Dakota: Lower Yellowstone.....	392	810	8	3,035	17	16
Nebraska-Wyoming: North Platte.....	2,648	8,811	18	24,850	102	60
Nevada: Newlands.....	740	2,537	5	2,700	11	9
New Mexico: Carlsbad.....	425	2,303	4	4,125	8	12
New Mexico-Texas: Rio Grande.....	4,669	20,042	33	141,901	80	122
Oregon: Umatilla.....	450	1,195	5	1,656	7	4
Oregon-California: Klamath.....	528	2,156	5	13,025	34	15
South Dakota: Belle Fourche.....	636	1,446	4	795	28	9
Utah: Strawberry Valley.....	2,742	6,500	12	18,500	26	26
Washington:						
Okanogan.....	392	1,064	3	3,500	6	10
Yakima-Sunnyside.....	3,438	10,959	11	7,570	42	30
Yakima-Tieton.....	1,370	3,708	8	27,175	11	4
Yakima-Kittitas.....			5	8,500	25	16
Wyoming:						
Riverton.....	10	24	3	2,300	3	8
Shoshone.....	814	1,859	5	1,441	6	9
Total.....	38,428	143,227	207	429,683	685	683

State and project	Banks			
	Number	Capital stock	Deposits	Number of depositors
Arizona: Salt River.....	15	\$1,600,000	\$32,500,000	45,360
Arizona-California: Yuma.....	3	215,000	2,604,200	7,615
California: Orland.....	2	185,000	1,317,300	4,300
Colorado:				
Grand Valley.....	4	365,000	3,958,800	9,000
Uncompahgre.....	6	506,500	3,659,200	11,250
Idaho:				
Boise.....	15	2,182,000	22,500,000	32,500
King Hill.....	1	20,000	300,000	900
Minidoka.....	5	200,000	2,575,000	4,477
Montana:				
Huntley.....	1	50,000	200,000	500
Milk River.....	11	435,000	5,594,800	9,003
Sun River.....	2	51,000	155,000	806
Montana-North Dakota: Lower Yellowstone.....	5	166,000	1,415,000	3,500
Nebraska-Wyoming: North Platte.....	15	460,000	5,998,300	16,087
Nevada: Newlands.....	1	75,000	1,227,200	1,922
New Mexico: Carlsbad.....	1	80,000	939,800	1,500
New Mexico-Texas: Rio Grande.....	9	2,175,000	31,990,100	37,143
Oregon: Umatilla.....	1	25,000	260,000	1,150
Oregon-California: Klamath.....	6	430,000	6,159,000	13,000
South Dakota: Belle Fourche.....	4	150,000	2,525,000	6,000
Utah: Strawberry Valley.....	5	235,000	1,750,000	8,350
Washington:				
Okanogan.....	3	125,000	1,286,000	2,500
Yakima-Sunnyside.....	9	265,000	2,251,000	6,779
Yakima-Kittitas.....	6	375,000	5,184,300	10,400
Wyoming:				
Riverton.....	2	75,000	511,000	1,300
Shoshone.....	3	85,000	626,000	2,270
Total.....	135	10,530,500	137,487,000	237,612

RECLAMATION TABLE 20.—*Summary of crop results on reclamation projects in 1927*¹

NOTE.—These figures are limited to crops covered by census on Government projects proper, excluding all crops in areas served with water under the Warren Act, but including nonirrigated crops grown on the projects.

Crop	Acreage cropped		Yields		Crop value		
	Total	Per cent of cropped	Total	Average per acre	Average per acre	Total	Per cent of total value of all crops
Cereals:			<i>Bushels</i>				
Barley.....	58,618	4.0	1,953,587	33.3	\$20.65	\$1,210,785	1.7
Corn.....	62,279	4.3	1,673,480	26.8	18.03	1,123,296	1.5
Oats.....	34,289	2.3	1,215,655	35.4	16.00	552,155	.8
Rye.....	6,261	.4	108,626	17.3	12.87	80,573	.1
Wheat.....	186,571	13.3	4,863,286	26.0	27.40	5,110,980	7.1
Total.....	348,018	24.3	9,814,634	28.2	23.21	8,077,789	11.2
Other grain and seed:							
Alfalfa seed.....	31,471	2.2	138,925	4.4	33.50	1,054,225	1.4
Clover seed.....	13,987	1.0	56,483	4.0	43.02	601,718	.8
Flaxseed.....	1,983	.1	23,635	12.0	20.72	41,083	-----
Total.....	47,441	3.3	219,043	4.6	35.77	1,697,026	2.3
Hay and forage:			<i>Tons</i>				
Alfalfa hay.....	438,675	31.0	1,277,376	2.9	27.54	12,081,678	16.8
Clover hay.....	8,819	.6	11,980	1.3	8.67	76,466	.1
Other hay.....	53,814	3.7	59,229	1.1	10.14	545,805	.7
Corn fodder.....	5,337	.4	12,584	2.3	14.00	74,828	.1
Other forage.....	19,447	1.3	53,115	2.7	34.46	670,223	.9
Pasture.....	312,092	22.0	-----	-----	10.44	3,258,549	4.5
Total.....	838,184	59.0	1,414,284	1.7	19.93	16,707,549	23.1
Vegetables and truck:			<i>Bushels</i>				
Beans.....	13,193	1.0	208,569	16.0	39.33	518,877	.7
Onions.....	5,653	.4	801,443	141.0	71.55	404,508	.5
Potatoes, white.....	58,162	4.0	10,543,065	181.3	74.52	4,334,330	6.0
Potatoes, sweet.....	499	-----	41,502	83.2	124.70	62,229	.1
Truck.....	41,337	2.9	-----	-----	186.45	7,707,525	10.7
Total.....	118,844	8.3	11,594,579	97.5	109.61	13,027,469	18.0
Fruits and nuts:			<i>Pounds</i>				
Apples.....	23,908	1.7	207,184,289	8,666	221.43	5,294,092	7.3
Peaches.....	2,201	.2	5,403,986	2,455	80.10	176,305	.2
Pears.....	4,930	.3	20,237,876	4,105	116.09	572,331	.8
Prunes.....	2,415	.2	10,296,239	4,263	83.87	202,543	.3
Citrus fruit.....	4,719	.3	50,549,940	10,712	332.56	1,569,348	2.2
Small fruit.....	3,136	.2	15,975,085	5,094	148.20	464,749	.7
Miscellaneous.....	5,023	.3	15,405,742	3,067	186.00	934,168	1.3
Total.....	46,332	3.2	325,053,157	7,016	198.86	9,213,536	12.8
Miscellaneous:			<i>Tons</i>				
Sugar beets.....	61,963	4.3	744,145	12.0	94.30	5,843,489	8.1
Cotton.....	178,875	12.5	{ 270,140,470	392.12	93.40	16,705,727	23.2
Cottonseed.....			{ 125,292,580	700.45			
Cane.....	1,169	.1	4,097	3.5	25.30	29,575	-----
Other crops.....	52,979	3.7	-----	-----	6.40	339,060	.5
Total.....	294,986	20.6	-----	-----	77.69	22,917,851	31.8
Duplication.....	275,225	19.2	-----	-----	-----	-----	-----
All crops ³	4,431,560	100.0	-----	-----	50.33	572,047,200	100.0

¹ Data are for calendar year (irrigation season) except those obtained from Salt River project, on which project the data are for corresponding "agricultural year," October, 1926, to September, 1927.

² Pounds.

³ Includes 104,750 acres of nonirrigated crops, grown on the projects, valued at \$1,061,750.

⁴ This total includes 12,930 acres on Strawberry Valley project, statistics for which by individual crops were not compiled.

⁵ This total includes \$405,980, Strawberry Valley project, statistics for which by individual crops were not compiled.

RECLAMATION TABLE 21.—*Crop values, 1906 to 1927*

Year	Projects	Under water service con- tracts	Total
1906.....	\$244,900	-----	\$244,900
1907.....	4,760,400	-----	4,760,400
1908.....	7,575,800	-----	7,575,800
1909.....	11,920,700	-----	11,920,700
1910.....	12,974,600	-----	12,974,600
1911.....	12,708,600	-----	12,708,600
1912.....	13,825,400	-----	13,825,400
1913.....	15,676,400	-----	15,676,400
1914.....	16,475,500	-----	16,475,500
1915.....	18,164,500	-----	18,164,500
1916.....	32,816,000	-----	32,816,000
1917.....	56,462,300	-----	56,462,300
1918.....	66,821,400	\$35,000,000	101,821,400
1919.....	88,974,100	64,004,750	152,978,850
1920.....	66,171,700	47,505,770	113,677,470
1921.....	49,620,300	44,906,130	94,526,430
1922.....	50,360,850	33,240,840	83,601,690
1923.....	65,046,300	37,557,860	102,604,160
1924.....	66,488,560	43,237,470	109,726,030
1925.....	77,608,880	53,655,850	131,264,730
1926.....	60,664,900	49,750,040	110,414,940
1927.....	72,047,200	61,160,010	133,207,210
Total.....	867,409,290	470,018,720	1,337,428,010

RECLAMATION TABLE 22.—*Summary of livestock and equipment on reclamation projects at close of 1927*¹

	Number	Value	
		Each	Total
Horses ²	77,842	\$52.00	\$4,027,610
Mules.....	10,015	85.36	854,971
Beef cattle ³	61,823	51.02	3,154,176
Purebred sires.....	280	107.28	29,935
Scrub sires.....	145	52.45	7,605
Dairy cattle.....	118,944	74.00	8,789,600
Purebred sires.....	1,179	131.00	154,451
Scrub sires.....	702	55.42	38,907
Sheep ⁴	307,398	9.32	2,864,960
Hogs.....	112,936	9.85	1,111,982
Hogs, brood sows.....	15,032	20.75	311,872
Fowls.....	2,068,812	1.15	2,392,593
Bees (hives).....	41,118	6.57	270,325
Rabbits (on Klamath project).....	1,352	1.65	2,231
Total stock value.....	-----	-----	24,011,218
Value of equipment.....	-----	-----	⁵ 12,821,252
Total stock and equipment.....	-----	-----	36,832,470
Increase in value over 1926:	-----	-----	-----
Stock.....	-----	-----	4,071,757
Equipment.....	-----	-----	1,176,264
Total increase.....	-----	-----	5,248,021

¹ Data are for calendar year except on Salt River project, where data are for "agricultural year," October, 1926, to September, 1927.

² On the Orland and Newlands projects the figures represent horses and mules.

³ On the Grand Valley project the figures represent beef and dairy cattle.

⁴ On the Orland project some goats were raised and counted in with the sheep; a few milk goats were raised on the Okanogan project.

⁵ Value of equipment on Salt River project is estimated.

RECLAMATION TABLE 23

Projects turned over to water users' organizations for operation and maintenance

Project	Year	Remarks
Salt River project, Arizona.....	1917	Association operating entire project.
Boise project, Idaho.....	1926	United States operating reserved works.
King Hill project, Idaho.....	1926	District operating entire project.
Minidoka project, Idaho:		
Gravity division.....	1917	United States operating reserved works.
South side pumping division.....	1926	Do.
Huntley project, Montana.....	1927	District operating entire project.
Sun River project, Montana: Fort Shaw Division.	1926	United States operating reserved works.
North Platte project, Nebraska-Wyoming:		
Interstate division.....	1926	Do.
Northport division.....	1927	Do.
Fort Laramie division.....	1927	Do.
Newlands project, Nevada.....	1927	District operating entire project.
Umatilla project, Oregon.....	1926	District operating entire project, except McKay Reservoir.
Strawberry Valley project, Utah.....	1927	Association operating entire project.
Shoshone project, Wyoming: Garland division.	1927	United States operating reserved works.

Projects to be turned over to water users' organizations for operation and maintenance

Grand Valley project, Colorado.....	{ 1932 and 1937	{ Contract pending.
Uncompahgre project, Colorado.....	{ 1932 and 1937	{ Contract executed. Entire project to be transferred.
Milk River project, Montana.....	1936	Certain works reserved.
Sun River project, Montana: Greenfields division.	.....	Contract executed; district to assume operation and maintenance at termination of construction program.
Lower Yellowstone project, Montana.....	1932	Contracts executed. Entire project to be transferred.
Belle Fourche project, South Dakota.....	1934	Do.
Shoshone project, Wyoming: Frannie division.	1930	Contract executed. United States to operate reserved works.
Okanogan project, Washington.....	1929	Contract pending.

NATIONAL PARK SERVICE

NATIONAL PARKS TABLE 1.—*National parks administered by the National Park Service*

[Number, 20; total area, 11,846 square miles; chronologically in order of creation]

Name	Location	When established	Area in square miles	Distinctive characteristics
Hot Springs ¹ ----- 1832	Middle Ar- kansas.	Apr. 20, 1832	1½	46 hot springs said to possess healing properties—Many hotels and boarding houses—Bathhouses under public control.
Yellowstone ¹ ----- 1872	Northwestern Wyoming, southwestern Montana, and northeastern Idaho.	Mar. 1, 1872	2 3, 348	More geysers than in all rest of world together—Boiling springs—Mud volcanoes—Petrified forests—Grand Canyon of the Yellowstone, remarkable for gorgeous coloring—Large lakes—Many large streams and waterfalls—Vast wilderness, greatest wild bird and animal preserve in the world—Exceptional trout fishing.
Sequoia ¹ ----- 1890	Middle eastern California.	{Sept. 25, 1890 July 3, 1926 }	604	The Big Tree National Park—Several hundred sequoia trees over 10 feet in diameter, some 25 to 37.3 feet in diameter—Towering mountain ranges—Startling precipices—Mount Whitney and Kern River country.
Yosemite ¹ ----- 1890	-----do-----	{Oct. 1, 1890 May 28, 1928 ³ }	1, 126	Valley of world-famed beauty—Lofty cliffs—Romantic vistas—Many waterfalls of extraordinary height—3 groves of big trees—High Sierra—Waterwheel Falls—Good trout fishing.
General Grant ¹ ----- 1890	-----do-----	Oct. 1, 1890	4	Created to preserve the celebrated General Grant Tree, 35 feet in diameter—6 miles from Sequoia National Park.
Mount Rainier ¹ ----- 1899	West central Washington.	{Mar. 2, 1899 May 28, 1926 }	325	Largest accessible single peak glacier system; 28 glaciers, some of large size; 48 square miles of glacier, 50 to 500 feet thick—Wonderful subalpine wild-flower fields.
Crater Lake ¹ ----- 1902	Southwestern Oregon.	May 22, 1902	249	Lake of extraordinary blue in crater of extinct volcano—Sides 1,000 feet high—Interesting lava formation—Fine fishing.
Platt----- 1902	Southern Oklahoma.	{July 1, 1902 Apr. 21, 1904 June 29, 1906 }	1½	{Many sulphur and other springs possessing medicinal value.
Wind Cave ¹ ----- 1903	South Dakota.	Jan. 9, 1903	17	Cavern having many miles of galleries and numerous chambers containing peculiar formations.
Sullys Hill----- 1904	North Dakota.	Apr. 27, 1904	1½	Small park with woods, streams, and a lake—Is an important wild-animal preserve.
Mesa Verde ¹ ----- 1906	Southwestern Colorado.	{June 29, 1906 June 30, 1913 ³ }	77	{Most notable and best preserved prehistoric cliff dwellings in United States, if not in the world.
Glacier ¹ ----- 1910	Northwestern Montana.	May 11, 1910	1, 534	Rugged mountain region of unsurpassed alpine character—250 glacier-fed lakes of romantic beauty—60 small glaciers—Precipices thousands of feet deep—Almost sensational scenery of marked individuality—Fine trout fishing.
Rocky Mountain ¹ ----- 1915	North middle Colorado.	{Jan. 26, 1915 ³ Feb. 14, 1917 June 2, 1924 ³ June 9, 1926 Aug. 1, 1916 May 1, 1922 ³ Apr. 11, 1928 ³ }	378	{Heart of the Rockies—Snowy range, peaks 11,000 to 14,255 feet altitude—Remarkable records of glacial period.
Hawaii ¹ ----- 1916	Hawaii-----	{Aug. 1, 1916 May 1, 1922 ³ Apr. 11, 1928 ³ }	248	{3 separate volcanic areas—Kilauea and Mauna Loa on Hawaii Haleakala on Maui.
Lassen Volcanic ¹ ----- 1916	Northern California.	{Aug. 9, 1916 Apr. 26, 1928 ³ May 21, 1928 }	124	{Only active volcano in United States proper—Lassen Peak, 10,465 feet—Cinder cone 6,879 feet—Hot springs—Mud geysers.
Mount McKinley ¹ ----- 1917	South central Alaska.	{Feb. 26, 1917 Jan. 30, 1922 ³ }	2, 645	{Highest mountain in North America—Rises higher above surrounding country than any other mountain in the world.
Grand Canyon ¹ ----- 1919	North central Arizona.	{Feb. 26, 1919 Feb. 25, 1927 ³ Mar. 7, 1928 ³ }	1, 009	{The greatest example of erosion and the most sublime spectacle in the world.
Lafayette ¹ ----- 1919	Maine coast---	Feb. 26, 1919	12	The group of granite mountains upon Mount Desert Island.
Zion ¹ ----- 1919	Southwestern Utah.	Nov. 19, 1919	12½	Magnificent gorge (Zion Canyon) depth from 800 to 2,000 feet, with precipitous walls—Of great beauty and scenic interest.
Bryce Canyon----- 1928	-----do-----	{June 7, 1924 ⁴ Feb. 25, 1928 ³ May 12, 1928 Sept. 15, 1928 }	22	{Box canyon filled with countless array of fantastically eroded pinnacles—Best exhibit of vivid coloring of earth's materials.

¹ General information circulars on these parks may be obtained free on application.

² In Wyoming, 3,114 square miles; in Montana, 198 square miles; in Idaho, 36 square miles.

³ Boundary changed. ⁴ Date acquisition private land as provided by act of June 7, 1924.

NATIONAL PARKS TABLE 2.—*National military and other parks administered by the War Department*

[Number, 11; total area, 22 square miles or 14,430.30 acres; chronologically in order of creation]

Name	Location	When established	Area (acres)	Description
Chickamauga and Chattanooga.	Georgia and Tennessee.	Aug. 19, 1890	6, 534. 85	Beautiful natural park; embraces battle fields of Chickamauga and Missionary Ridge and scenes of other conflicts of the Civil War fought in the vicinity of Chattanooga during 1863.
Antietam Battle Field.....	Maryland.....	Aug. 30, 1890	40	Scene of one of the greatest battles of the Civil War.
Shiloh.....	Tennessee.....	Dec. 27, 1894	3, 546	Natural park embracing the battle field of Shiloh near Pittsburg Landing.
Gettysburg ¹	Pennsylvania.....	Feb. 11, 1895	2, 530. 32	Beautiful natural park; scene of Civil War combat; probably better marked than any other battle field in the world.
Vicksburg.....	Mississippi.....	Feb. 21, 1899	1, 322. 63	Beautiful natural park; scene of the siege and surrender of Vicksburg in 1863 during the Civil War.
Abraham Lincoln's Birth-place. ¹	Kentucky.....	July 17, 1916	110. 5	Contains the log cabin and part of the farm where Abraham Lincoln was born.
Guilford Courthouse.....	North Carolina.....	Mar. 2, 1917	131	Near Greensboro; scene of one of the great battles of the Revolution; fought in 1781.
Moore's Creek.....	do.....	June 2, 1926	30	Scene of one of most memorable battles of Revolutionary War.
Petersburg.....	Virginia.....	July 3, 1926	185	Scene of campaign and siege and defense of Petersburg, Va., in 1864 and 1865.
Fredericksburg and Spotsylvania.	do.....	Feb. 14, 1927	(?)	Scene of battles of Fredericksburg, Spotsylvania, Wilderness, Chancellorsville, and Salem Church at or near Fredericksburg.
Stones River.....	Tennessee.....	Mar. 3, 1927	(?)	Scene of the battle of Stones River in Tennessee.

¹ Donated in whole or in part to the United States.² Undetermined.NATIONAL PARKS TABLE 3.—*National monuments administered by the National Park Service*

[Number, 32; total area, 3,723.7 square miles; chronologically in order of creation]

Name	Location	When established	Area (acres)	Description
Devils Tower.....	Wyoming.....	Sept. 24, 1906	1, 152	Remarkable natural rock tower, of volcanic origin, 1,200 feet in height.
Montezuma Castle.	Arizona.....	Dec. 8, 1906	¹ 160	Prehistoric cliff-dwelling ruin of unusual size situated in a niche in face of a vertical cliff. Of scenic and ethnologic interest.
El Morro.....	New Mexico.....	{Dec. 8, 1906 June 18, 1917 }	240	Enormous sandstone rock eroded in form of a castle, upon which inscriptions have been placed by early Spanish explorers. Contains cliff-dweller ruins. Of great historic, scenic, and ethnologic interest.
Petrified Forest....	Arizona.....	{Dec. 8, 1906 July 31, 1911 }	25, 625	Abundance of petrified coniferous trees, one of which forms a small natural bridge. Is of great scientific interest.
Chaco Canyon.....	New Mexico.....	{Mar. 11, 1907 Jan. 10, 1928 }	¹ 21, 509. 40	Numerous cliff-dweller ruins, including communal houses, in good condition, and but little excavated.
Muir Woods ²	California.....	{Jan. 9, 1908 Sept. 22, 1921 }	426. 43	One of the most noted redwood groves in California, and was donated by Hon. William Kent, ex-Member of Congress. Located 7 miles from San Francisco.
Pinnacles.....	do.....	{Jan. 16, 1908 May 7, 1923 July 2, 1924 }	2, 980. 26	Many spirelike rock formations, 600 to 1,000 feet high, visible many miles; also numerous caves and other formations.

¹ Estimated.² Donated to the United States.

NATIONAL PARKS TABLE 3.—*National monuments administered by the National Park Service—Continued*

Name	Location	When established	Area (acres)	Description
Natural Bridges...	Utah.....	{ Apr. 16, 1908 Sept. 25, 1909 Feb. 11, 1916 }	12,740	Three natural bridges, among largest examples of their kind. Largest bridge is 222 feet high, 65 feet thick at top of arch; arch is 28 feet wide; span, 261 feet; height of span, 157 feet. Other two slightly smaller.
Lewis and Clark Cavern. ²	{ Montana.....	{ May 11, 1908 May 16, 1911 }	160	Immense limestone cavern of great scientific interest, magnificently decorated with stalactite formations. Now closed to public because of depredations by vandals.
Tumacacori.....	Arizona.....	Sept. 15, 1908	10	Ruin of Franciscan mission dating from seventeenth century. Being restored by National Park Service as rapidly as funds permit.
Navajo.....	do.....	{ Mar. 20, 1909 Mar. 14, 1912 }	360	{ Contains numerous pueblo, or cliff-dweller ruins, in good preservation.
Shoshone Cavern.	Wyoming.....	Sept. 21, 1909	210	Cavern of considerable extent, near Cody.
Gran Quivira.....	New Mexico..	{ Nov. 1, 1909 Nov. 25, 1919 }	560	{ One of the most important of earliest Spanish mission ruins in the Southwest. Monument also contains pueblo ruins.
Sitka.....	Alaska.....	Mar. 23, 1910	57	Park of great natural beauty and historic interest as scene of massacre of Russians by Indians. Contains 16 totem poles of best native workmanship.
Rainbow Bridge..	Utah.....	May 30, 1910	160	Unique natural bridge of great scientific interest and symmetry. Height 309 feet above water, and span is 278 feet, in shape of rainbow.
Colorado.....	Colorado.....	May 24, 1911	13,883	Many lofty monoliths, and is wonderful example of erosion, and of great scenic beauty and interest.
Papago Saguaro...	Arizona.....	{ Jan. 31, 1914 Dec. 28, 1922 }	1,940.43	{ Splendid collection of characteristic desert flora and numerous pictographs. Interesting rock formations.
Dinosaur.....	Utah.....	Oct. 4, 1915	80	Deposits of fossil remains of prehistoric animal life of great scientific interest.
Capulin Mountain.	New Mexico..	Aug. 9, 1916	681	Cinder cone of geologically recent formation.
Verendrye.....	North Dakota	June 29, 1917	253.04	Includes Crowhigh Butte, from which Explorer Verendrye first beheld territory beyond the Missouri River.
Casa Grande.....	Arizona.....	{ June 22, 1892 ³ Dec. 10, 1909 Aug. 3, 1918 June 7, 1926 }	472.5	{ These ruins are one of the most noteworthy relics of a prehistoric age and people within the limits of the United States. Discovered in ruinous condition in 1694.
Katmai.....	Alaska.....	{ Sept. 24, 1918 Sept. 5, 1923 }	1,087,990	{ Wonderland of great scientific interest in the study of volcanism. Phenomena exist upon a scale of great magnitude. Includes Valley of Ten Thousand Smokes.
Scotts Bluff.....	Nebraska.....	{ Dec. 12, 1919 May 9, 1924 }	1,893.83	{ Region of historic and scientific interest. Many famous old trails traversed by the early pioneers in the winning of the West passed over and through this monument.
Yucca House ²	Colorado.....	Dec. 19, 1919	9.6	Located on eastern slope of Sleeping Ute Mountain. Is pile of masonry of great archeological value, relic of prehistoric inhabitants.
Fossil Cycad.....	South Dakota.	Oct. 21, 1922	320	Area containing deposits of fossil plants.
Aztec Ruins ²	New Mexico..	{ Jan. 24, 1923 July 2, 1928 }	17.2	{ Prehistoric ruin of pueblo type containing 500 rooms.
Hovenweep.....	Utah-Colorado	Mar. 2, 1923	285.8	Four groups of prehistoric towers, pueblos, and cliff dwellings.
Pipe Spring.....	Arizona.....	May 31, 1923	40	Old stone fort and spring of pure water in desert region. Serves as memorial to early western pioneer life.
Carlsbad Cave...	New Mexico..	Oct. 25, 1923	719.22	Beautifully decorated limestone cavern, believed to be largest yet discovered.
Craters of the Moon.	{ Idaho.....	{ May 2, 1924 July 23, 1928 }	51,200	{ Best example of fissure lava flows; volcanic region with weird landscape effects.
Wupatki.....	Arizona.....	Dec. 9, 1924	2,234.10	Prehistoric dwellings of ancestors of Hopi Indians.
Glacier Bay.....	Alaska.....	Feb. 26, 1925	1,164,800	Contains tidewater glaciers of first rank.

¹ Estimated.² Donated to the United States. ³ From June 22, 1892, until Aug. 3, 1918, classified as a national park.

NATIONAL PARKS TABLE 4.—*National monuments administered by the Department of Agriculture*

[Number, 14; total area, 599 square miles; chronologically in order of creation]

Name	Location	Date of creation	Area (acres)	Description
Gila Cliff Dwellings.	New Mexico.	Nov. 16, 1907	160	Numerous cliff-dweller ruins of much interest and in good preservation.
Tonto.	Arizona.	Dec. 19, 1907	¹ 640	Do.
Jewel Cave.	South Dakota.	Feb. 7, 1908	¹ 1,280	Limestone cavern of much beauty and considerable extent, limits of which are as yet unknown.
Wheeler.	Colorado.	Dec. 7, 1908	300	Of much interest from geological standpoint as example of eccentric erosion and volcanic action. Of much scenic beauty.
Mount Olympus.	Washington.	{ Mar. 2, 1909 Apr. 17, 1912 May 11, 1915	299,370	{ Contains many objects of great and unusual scientific interest, including many glaciers. Is summer range and breeding ground of the Olympic elk.
Oregon Caves.	Oregon.	July 12, 1909		
Devils Postpile.	California.	July 6, 1911	800	Extensive caves in limestone formation of much beauty; magnitude not entirely ascertained.
Walnut Canyon.	Arizona.	Nov. 30, 1915	960	Spectacular mass of hexagonal basaltic columns, like an immense pile of posts. Said to rank with famous Giant's Causeway in Ireland.
Bandelier.	New Mexico.	Feb. 11, 1916	22,075	Contains cliff dwellings of much scientific and popular interest.
Old Kasaan.	Alaska.	Oct. 25, 1916	38	Vast number of cliff-dweller ruins, with artificial caves, stone sculpture, and other relics of prehistoric life.
Lehman Caves.	Nevada.	Jan. 24, 1922	593	Abandoned Indian village in which there are numerous remarkable totem poles and other objects of historical interest.
Timpanogos Cave.	Utah.	Oct. 14, 1922	250	Limestone caverns of much beauty and of scientific interest and importance.
Chiricahua.	Arizona.	Apr. 18, 1924	4,480	Limestone cavern.
Lava Beds.	California.	Nov. 21, 1925	45,967	Natural rock formations within Coronado National Forest.
				Interesting ice caves. Battleground of of Modoc Indian War, 1873.

¹ Estimated.NATIONAL PARKS TABLE 5.—*National monuments administered by the War Department*

[Number, 13; total area, 221.81 acres; chronologically in order of creation]

Name	Location	Date of creation	Area (acres)	Description
Chalmette.	Louisiana.	May 24, 1907	17.47	Erected in memory of the Battle of New Orleans, which was fought on Jan. 8, 1815.
Big Hole Battle Field.	Montana.	June 23, 1910	5	Site of battle field on which battle was fought Aug. 9, 1877, between a small force of United States troops and a much larger force of Nez Perce Indians, resulting in rout for the Indians.
Cabrillo.	California.	{ Oct. 14, 1913 May 12, 1926	.5	{ Of historic interest because of discovery of the territory now partly embraced in the State of California by Juan Rodriguez Cabrillo, who at this point first sighted land on Sept. 28, 1542.
Mound City Group.	Ohio.	Mar. 2, 1923		
Fort Wood.	New York.	Oct. 15, 1924	2.5	Famous group of prehistoric mounds in Camp Sherman Military Reservation.
Castle Pinckney.	South Carolina.	.....do.....	3.5	Site of the Statue of Liberty.
Fort Pulaski.	Georgia.	.....do.....	20	Fortification built in 1810 to replace a Revolutionary fort.
Fort Marion.	Florida.	.....do.....	18.09	Built in 1810 to replace Fort Greene of the Revolution.
Fort Matanzas.	.....do.....	.....do.....	1	Fort built by Spaniards in 1656.
Meriwether Lewis.	Tennessee.	Feb. 6, 1925	50	Relic of Spanish invasion.
Fort Niagara.	New York.	Sept. 5, 1925	.0074	Contains grave of Captain Lewis of the Lewis and Clark Expedition.
Fort McHenry.	Maryland.	Mar. 3, 1925	46.75	Site for erection of cross to commemorate a cross erected by Father Millett in 1688 on what is now the Fort Niagara Military Reservation.
White Plains Battle Field.	New York.	May 18, 1926	None.	Restored and preserved as birthplace of "Star-Spangled Banner."
				Memorial tablet to indicate the position of the Revolutionary Army under the command of General Washington.

NATIONAL PARKS TABLE 6.—*Visitors to national parks, 1913-1928*

Name of park	1913	1914	1915	1916	1917	1918	1919	1920
Hot Springs.....	¹ 135,000	¹ 125,000	¹ 115,000	¹ 118,740	¹ 135,000	¹ 140,000	¹ 160,490	¹ 162,850
Yellowstone.....	24,929	20,250	51,895	35,849	35,400	21,275	62,261	79,777
Sequoia.....	3,823	4,667	7,647	10,780	18,510	15,001	30,443	31,508
Yosemite.....	13,735	15,145	33,452	33,390	34,510	33,497	58,362	68,906
General Grant.....	2,756	3,735	10,523	15,360	17,390	15,496	21,574	19,661
Mount Rainier.....	13,501	15,038	35,166	23,989	35,568	43,901	55,232	56,491
Crater Lake.....	6,253	7,096	11,371	12,265	11,645	13,231	16,645	20,135
Wind Cave.....	3,988	3,592	2,817	¹ 9,000	16,742	¹ 36,000	¹ 25,000	¹ 38,000
Platt.....	¹ 35,000	¹ 30,000	¹ 20,000	¹ 30,000	¹ 35,000	14,431	26,312	27,023
Sullys Hill.....	¹ 300	¹ 500	¹ 1,000	¹ 1,500	2,207	4,188	4,026	9,341
Mesa Verde.....	280	502	663	1,385	2,223	2,058	2,287	2,890
Glacier.....	12,138	14,168	14,265	12,839	18,387	9,086	18,956	22,449
Rocky Mountain.....	-----	-----	¹ 31,000	¹ 51,000	117,186	101,497	169,492	240,966
Hawaii.....	-----	-----	-----	(²)	(²)	(²)	(²)	(²)
Lassen Volcanic.....	-----	-----	-----	(²)	¹ 8,500	¹ 2,000	¹ 2,500	¹ 2,000
Mount McKinley.....	-----	-----	-----	-----	(²)	(²)	(²)	(²)
Grand Canyon.....	-----	-----	-----	-----	-----	-----	37,745	67,315
Lafayette.....	-----	-----	-----	-----	-----	-----	¹ 64,000	¹ 66,500
Zion.....	-----	-----	-----	-----	-----	-----	-----	3,692
Total.....	251,703	235,193	334,799	356,097	488,268	451,661	755,325	919,504

Name of park	1921	1922	1923	1924	1925	1926	1927	1928
Hot Springs.....	¹ 130,968	¹ 106,164	¹ 112,000	¹ 164,175	¹ 265,500	¹ 260,000	¹ 181,523	¹ 199,099
Yellowstone.....	81,651	98,223	138,352	144,158	154,282	187,807	200,825	230,984
Sequoia.....	28,263	27,514	30,158	34,468	46,677	89,404	100,684	98,035
Yosemite.....	91,513	100,506	130,046	105,894	209,166	274,209	490,430	460,619
General Grant.....	30,312	50,456	46,230	35,020	40,517	50,597	47,996	51,988
Mount Rainier.....	55,771	70,371	123,708	161,473	173,004	161,796	200,051	219,531
Crater Lake.....	28,617	33,016	52,017	64,312	65,018	86,019	82,354	113,323
Platt.....	¹ 60,000	¹ 70,000	¹ 117,710	¹ 134,874	¹ 143,380	¹ 124,284	¹ 294,954	¹ 280,638
Wind Cave.....	28,336	31,016	41,505	52,166	69,267	85,466	81,023	100,309
Sullys Hill.....	9,100	¹ 9,548	8,478	8,035	9,183	19,921	22,632	24,979
Mesa Verde.....	3,003	4,251	5,236	7,109	9,043	11,356	11,915	16,760
Glacier.....	19,736	23,935	33,988	33,372	40,063	37,325	41,745	53,454
Rocky Mountain.....	¹ 273,737	³ 219,164	218,000	224,211	233,912	¹ 225,027	¹ 229,862	¹ 235,057
Hawaii.....	¹ 16,071	27,750	41,150	52,110	64,155	¹ 35,000	37,551	78,414
Lassen Volcanic.....	¹ 10,000	¹ 10,000	¹ 9,500	¹ 12,500	¹ 12,596	18,739	20,089	26,057
Mount McKinley.....	(²)	⁴ 7	⁴ 34	⁴ 62	⁴ 206	⁴ 533	⁴ 651	⁴ 802
Grand Canyon.....	67,485	84,700	102,166	108,256	134,053	140,252	162,356	167,226
Lafayette.....	¹ 69,836	73,779	64,200	71,758	73,673	101,256	123,699	134,897
Zion.....	2,937	4,109	6,408	8,400	16,817	21,964	24,303	30,016
Total.....	1,007,335	1,044,502	1,280,886	1,422,353	1,760,512	1,930,865	2,354,643	2,522,188

¹ Estimated.² No record.³ Indicated loss in travel from 1921 due largely to better methods of checking and estimating employed.⁴ Actual park visitors; many miners and prospectors passed through park.

NATIONAL PARKS TABLE 7.—*Visitors to the national monuments in 1923-1928* ¹

Name	1923	1924	1925	1926	1927	1928
Aztec Ruins (New Mexico).....	6,234	5,968	² 7,000	5,646	7,298	18,359
Capulin Mountain (New Mexico).....	² 1,000	² 7,000	² 7,000	14,965	12,617	² 7,600
Carlsbad Cave (New Mexico).....	.....	³ 1,280	1,794	10,904	26,436	46,335
Casa Grande (Arizona).....	6,787	9,583	13,587	16,542	28,818	28,274
Chaco Canyon (New Mexico).....	.....	² 2,000	2,500	² 1,500	1,425	.....
Colorado (Colorado).....	² 7,000	² 8,000	² 9,000	² 9,000	² 9,500	² 10,000
Craters of the Moon (Idaho).....	.....	.....	3,349	4,620	5,771	7,768
Devils Tower (Wyoming).....	² 3,000	² 7,800	8,450	16,640	² 10,400	² 8,000
El Morro (New Mexico).....	² 2,500	² 3,200	² 1,800	5,794	5,178	5,356
Gran Quivira (New Mexico).....	.....	.....	² 1,000	1,577	2,034	2,779
Hovenweep (Utah-Colorado).....	.....	.....	250	² 250	263	240
Katmai (Alaska).....	15	17	.....	.....	.....	.....
Montezuma Castle (Arizona).....	² 7,400	² 7,500	² 9,000	12,385	15,400	16,232
Muir Woods (California).....	91,253	92,391	93,643	97,426	101,514	103,571
Natural Bridges (Utah).....	20	62	.....	68	82	175
Navajo (Arizona).....	.....	85	200	² 250	² 260	315
Papago Saguaro (Arizona).....	² 6,000	² 10,000	² 30,000	² 53,000	60,540	66,450
Petrified Forest (Arizona).....	45,475	42,781	55,227	53,345	61,761	75,225
Pinnacles (California).....	² 6,500	8,973	² 10,000	10,167	11,265	13,216
Pipe Spring (Arizona).....	.....	.....	² 4,000	16,728	16,853	17,321
Rainbow Bridge (Utah).....	142	115	250	² 300	² 300	² 200
Scotts Bluff (Nebraska).....	² 20,000	² 35,000	² 24,000	² 27,000	² 30,000	² 37,500
Shoshone Cavern (Wyoming).....	.....	.....	.....	.....	.....	² 300
Sitka (Alaska).....	.....	.....	.....	² 2,500	² 3,000	² 3,000
Tumacacori (Arizona).....	² 6,000	² 8,800	² 10,500	13,683	16,761	17,341
Verendrye (North Dakota).....	² 3,500	.....	² 1,400	² 8,000	² 15,000	² 15,000
Wupatki (Arizona).....	.....	.....	² 500	² 600	² 450	² 500
Yucca House (Colorado).....	.....	.....	² 100	² 150	196	174
Total.....	212,826	248,555	294,050	384,040	443,197	502,656

¹ No records for other 5 national monuments.² Estimated.³ Opened to public June 1, 1924.NATIONAL PARKS TABLE 8.—*Private automobiles entering the national parks during seasons 1921-1928* ¹

Name of park	1921	1922	1923	1924	1925	1926	1927	1928
Hot Springs ².....	.....	.....	.....	.....	.....	.....	³ 1,559	³ 1,455
Yellowstone.....	15,736	18,253	27,359	30,689	33,068	³ 44,326	49,055	58,186
Sequoia ⁴	7,139	7,886	9,796	11,032	14,273	26,503	30,165	29,290
Yosemite.....	18,947	19,583	27,233	32,814	49,229	74,885	137,296	131,689
General Grant.....	6,545	12,010	12,036	9,118	11,108	12,869	13,172	14,681
Mount Rainier.....	12,271	17,149	27,655	38,351	39,860	38,626	48,275	50,005
Crater Lake.....	7,892	9,429	15,377	19,301	19,451	26,442	25,667	34,869
Wind Cave ²	9,078	10,096	13,570	17,200	22,598	28,332	26,879	33,300
Platt ²	21,848	⁵ 30,000	⁵ 50,000	⁵ 57,400	⁵ 60,000	45,796	⁵ 75,000	⁵ 70,000
Sullys Hill ².....	.....	.....	.....	.....	2,271	4,484	⁵ 4,700	5,229
Mesa Verde.....	651	969	1,255	1,803	2,197	3,054	3,315	4,803
Glacier.....	2,614	2,416	5,599	6,756	7,585	6,727	7,980	9,860
Rocky Mountain ²	⁵ 57,438	⁵ 52,112	⁵ 51,800	⁵ 53,696	⁵ 58,057	⁵ 50,407	⁵ 54,109	⁵ 57,381
Hawaii ².....	.....	.....	8,025	10,150	12,650	⁵ 6,500	8,345	14,505
Lassen Volcanic ².....	.....	.....	.....	.....	2,646	5,423	5,899	8,137
Grand Canyon.....	5,104	7,890	11,731	13,052	19,910	22,849	28,479	32,316
Lafayette ²	9,958	8,650	8,600	12,561	9,381	15,361	29,181	31,998
Zion.....	604	662	1,446	1,993	3,928	4,796	6,203	7,532
Total.....	175,825	197,105	271,482	315,916	368,212	417,386	557,079	595,236

¹ Automobiles entering parks with or without licenses, to and including Sept. 30, 1928.² No license required.³ Count made only at public camp ground.⁴ License required only for Giant Forest Road.⁵ Estimated.

NATIONAL PARKS TABLE 9.—*Automobile and motor-cycle licenses issued during seasons 1924-1928*

Name of park ¹	1924		1925		1926		1927		1928	
	Auto-mobiles	Motor cycles	Auto-mobiles	Motor cycles	Auto-mobiles	Motor cycles	Auto-mobiles	Motor cycles	Auto-mobiles	Motor cycles
Yellowstone.....	28,912	158	31,488	144	38,942	135	43,062	191	54,139	179
Sequoia ²	3,684	---	4,312	---	10,781	---	16,383	---	16,599	---
Yosemite.....	17,696	89	23,203	68	29,302	82	96,580	218	75,213	183
General Grant.....	6,524	---	7,023	---	4,880	---	6,702	---	6,380	---
Mount Rainier.....	19,267	321	21,753	23	20,490	101	28,340	47	32,885	33
Crater Lake.....	16,033	44	15,471	37	23,249	35	15,046	18	27,898	46
Mesa Verde.....	1,812	2	2,075	3	3,222	3	2,959	7	4,256	13
Glacier.....	3,981	2	6,039	3	5,240	---	5,196	---	7,350	5
Grand Canyon.....	---	---	---	---	9,707	---	21,629	---	26,429	---
Zion.....	---	---	---	---	3,596	---	4,069	481	6,107	---
Total.....	97,809	616	111,364	278	149,109	356	239,966	262	257,256	459

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Lassen Volcanic, Sullys Hill, Rocky Mountain, and Lafayette National Parks. No roads in Mount McKinley Park.

² License required only for Giant Forest Road.

Licenses not required in certain parks because of small road mileage or unimproved condition of roads (see footnote 1). Licenses also not required for travel on unimproved roads in other parks. No charge for license issued for operating cars on official business.

NATIONAL PARKS TABLE 10.—*Receipts collected from automobiles and motor cycles during seasons 1924-1928*

Name of park ¹	1924	1925	1926 ²	1927	1928
Yellowstone.....	\$217,235.00	\$236,520.00	\$119,286.50	\$129,377.00	\$162,596.00
Sequoia ³	9,210.00	10,780.00	10,481.00	16,383.00	16,599.00
Yosemite.....	87,278.00	114,556.00	75,179.00	192,370.00	150,609.00
General Grant.....	3,287.00	3,511.50	2,440.00	3,351.00	3,190.00
Mount Rainier.....	48,488.50	54,405.50	21,488.00	28,387.00	32,918.00
Crater Lake.....	40,130.00	38,714.50	26,594.50	15,064.00	27,944.00
Mesa Verde.....	2,719.00	3,114.00	3,377.00	2,965.50	4,269.00
Glacier.....	5,528.50	9,338.50	5,240.00	5,196.00	7,355.00
Grand Canyon.....	---	---	9,707.00	21,629.00	26,429.00
Zion.....	---	---	1,798.00	2,034.50	3,053.50
Total.....	413,876.00	470,940.00	275,591.00	416,757.00	767,857.50

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Lassen Volcanic, Sullys Hill, Rocky Mountain, and Lafayette National Parks. No roads in Mount McKinley Park.

² Rates reduced in 1926.

³ License required only for Giant Forest Road.

NATIONAL PARKS TABLE 11.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during the fiscal years 1917-1928,¹ inclusive; also appropriations for the fiscal year 1929*

Name of the national park	Appropriations		Revenue	
	Appropriated	Expended	Received	Expended
Hot Springs:				
1917.....			\$35,611.75	\$31,302.98
1918.....			28,883.44	42,822.02
1919.....	\$140,000.00	\$140,000.00	52,109.15	32,130.36
1920.....			45,682.85	35,710.33
1921 (deficiency).....	60,000.00	60,000.00	57,807.00	74,021.19
1922.....			55,339.15	85,043.85
1923.....	63,900.00	63,289.88	56,669.16	(³)
1924.....	67,600.00	67,294.82	44,769.53	
1925.....	78,000.00	\$85,541.38	\$60,577.70	
1925 (deficiency).....	11,800.00			
1926.....	72,100.00	69,537.19	\$55,421.75	
1927.....	71,000.00	69,250.58	47,535.70	
1928.....	69,800.00	67,443.19	47,695.50	
1929.....	68,000.00			
Yellowstone:				
1917.....	8,500.00	8,500.00	54,795.69	53,775.61
1918.....	10,500.00	9,645.82	71,393.56	96,812.34
1919.....	334,920.00	332,583.03	42,775.50	(³)
1919.....	\$3,259.48	539.44		
1920.....	255,500.00	253,577.15	120,027.61	
1920 (deficiency).....	71,026.64	71,026.64		
1921.....	278,000.00	285,992.28	158,806.84	
1921 (deficiency).....	8,000.00			
1922.....	350,000.00	348,746.54	165,014.53	
1923.....	361,800.00	361,687.86	203,140.02	
1924.....	368,000.00	\$395,139.06	299,132.97	
1924 (deficiency).....	27,700.00			
1925.....	372,800.00	394,086.50	318,861.60	
1925 (deficiency).....	24,103.00			
1926.....	396,000.00	\$393,190.23	356,193.56	
1927.....	398,000.00	397,861.12	230,674.69	
1928.....	400,000.00	\$399,150.00	251,663.11	
1929.....	434,000.00			
Sequoia:				
1917.....	22,300.00	15,605.28	10,326.60	415.04
1918.....	50,000.00	50,000.00		
1919.....	25,000.00	24,578.71	13,402.53	25,508.45
1919.....	30,510.00	30,420.98	9,772.52	(³)
1920.....	35,000.00	34,824.54	15,899.00	
1921.....	36,000.00	35,732.79	19,584.99	
1922.....	86,000.00	85,961.84	20,086.27	
1923.....	78,000.00	77,671.62	23,917.22	
1924.....	120,000.00	119,590.60	24,220.21	
1925.....	136,000.00	140,638.90	19,981.08	
1925 (deficiency).....	5,810.00			
1926.....	71,710.00	\$72,412.22	26,356.16	
1927.....	73,750.00	73,750.00	29,486.10	
1928.....	109,000.00	108,863.10	35,105.83	
1929.....	113,000.00			
Yosemite:				
1917.....	250,000.00	249,987.45	53,500.66	55,098.45
1918.....	235,000.00	226,368.29	65,865.65	88,975.62
1919.....	255,000.00	254,294.64	57,520.03	(³)
1920.....	200,000.00	197,611.29	85,601.54	
1921.....	300,000.00	300,645.44	95,894.47	
1921 (deficiency).....	3,000.00			
1922.....	300,000.00	295,079.94	131,797.51	
1923.....	280,000.00	278,218.50	148,860.60	
1924.....	295,000.00	\$294,768.42	173,732.28	
1925.....	309,000.00	324,414.85	137,200.14	
1925 (deficiency).....	21,414.00			
1926.....	252,714.00	243,703.59	231,209.14	
1927.....	256,640.00	254,170.31	239,382.94	
1928.....	301,000.00	\$257,363.73	276,438.20	
1928 (deficiency).....	15,000.00			
1929.....	387,250.00			
General Grant:				
1917.....	2,000.00	1,999.55	1,153.78	536.97
1918.....	2,000.00	1,999.97	1,801.63	3,951.88
1919.....	4,500.00	4,481.51	1,063.90	(³)
1920.....	6,000.00	5,992.79	1,870.83	
1921.....	5,300.00	5,300.00	2,663.37	
1922.....	6,000.00	5,981.24	3,480.45	
1923.....	6,500.00	6,419.88	3,180.16	

Footnotes at end of table.

NATIONAL PARKS TABLE 11.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during the fiscal years 1917-1928,¹ inclusive; also appropriations for the fiscal year 1929—Continued*

Name of the national park	Appropriations		Revenue	
	Appropriated	Expended	Received	Expended
General Grant—Continued.				
1924.....	\$50,000.00	\$49,874.91	\$4,847.73	-----
1925.....	14,175.00	15,151.51	2,907.54	-----
1925 (deficiency).....	1,180.00			-----
1926.....	12,180.00	11,986.37	3,298.55	-----
1927.....	12,300.00	12,281.07	3,686.63	-----
1928.....	13,650.00	13,529.26	3,488.90	-----
1929.....	15,650.00			-----
Mount Rainier:				
1917.....	30,000.00	29,999.19	14,346.80	\$17,617.04
1918.....	75,000.00	74,846.67	17,241.25	34,715.96
1919.....	24,600.00	24,552.28	17,336.47	(²)
1920.....	32,500.00	32,446.01	22,153.76	-----
1921.....	40,000.00	39,819.34	24,967.79	-----
1922.....	150,000.00	149,497.31	22,286.59	-----
1923.....	106,800.00	105,721.05	29,133.17	-----
1924.....	133,000.00	135,813.76	43,014.33	-----
1924 (deficiency).....	13,000.00	117,906.78	51,395.58	-----
1925.....	100,000.00			-----
1925 (deficiency).....	5,230.00	101,777.55	56,631.25	-----
1926.....	106,500.00			-----
1927.....	111,000.00	107,294.68	28,613.30	-----
1928.....	108,000.00	105,447.74	32,495.50	-----
1929.....	141,000.00			-----
Crater Lake:				
1917.....	8,000.00	7,999.88	4,565.25	-----
1918.....	15,000.00	14,738.44	5,505.72	-----
1919.....	13,225.00	13,203.84	5,958.21	(³)
1920.....	28,225.00	28,162.05	8,327.73	-----
1921.....	25,300.00	25,223.40	9,784.98	-----
1922.....	25,300.00	25,290.41	15,277.53	-----
1923.....	32,000.00	31,787.77	18,139.75	-----
1924.....	35,000.00	34,822.56	30,495.93	-----
1925.....	30,700.00	32,613.36	39,789.49	-----
1925 (deficiency).....	1,980.00			-----
1926.....	35,980.00	35,865.26	41,486.50	-----
1927.....	37,160.00	37,084.77	20,232.00	-----
1928.....	63,590.00	62,382.53	22,927.69	-----
1929.....	47,100.00			-----
Platt:				
1917.....	8,000.00	8,000.00	434.11	138.28
1918.....	7,180.00	7,179.84	1,010.40	1,699.88
1919.....	7,500.00	7,485.05	482.63	(³)
1920.....	6,000.00	5,980.24	486.59	-----
1921.....	9,000.00	8,900.70	726.20	-----
1922.....	7,500.00	7,238.26	519.80	-----
1923.....	7,500.00	7,325.62	65.30	-----
1924.....	10,000.00	9,982.48	74.14	-----
1925.....	10,000.00	11,916.20	60.50	-----
1925 (deficiency).....	1,920.00			-----
1926.....	17,920.00	17,818.60	54.13	-----
1927.....	12,400.00	12,154.12	50.00	-----
1928.....	13,050.00	12,991.87	77.16	-----
1929.....	18,000.00			-----
Wind Cave:				
1917.....	2,500.00	2,499.87	1,632.60	1,013.04
1918.....	2,500.00	2,498.40	4,082.60	8,006.53
1919.....	4,000.00	3,988.77	2,533.15	(³)
1920.....	4,000.00	3,987.24	3,714.15	-----
1921.....	5,000.00	4,971.55	2,918.20	-----
1922.....	7,500.00	7,500.00	3,785.25	-----
1923.....	7,500.00	7,443.84	3,869.00	-----
1924.....	10,000.00	9,934.56	3,856.50	-----
1925.....	10,000.00	10,800.63	4,232.61	-----
1925 (deficiency).....	960.00			-----
1926.....	10,960.00	11,827.07	5,934.54	-----
1927.....	10,275.00	10,275.00	6,840.50	-----
1928.....	10,850.00	11,500.00	12,725.50	-----
1929.....	11,000.00			-----
Mesa Verde:				
1917.....	10,000.00	9,999.00	130.14	(³)
1918.....	10,000.00	9,913.05	2,763.75	-----
1919.....	18,000.00	17,022.44	3,348.66	-----
1920.....	11,000.00	10,959.69	3,317.95	-----
1921.....	14,000.00	13,929.71	3,771.35	-----

Footnotes at end of table.

NATIONAL PARKS TABLE 11.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during the fiscal years 1917-1928,¹ inclusive; also appropriations for the fiscal year 1929—Continued*

Name of the national park	Appropriations		Revenue	
	Appropriated	Expended	Received	Expended
Mesa Verde—Continued.				
1922	\$16,400.00	\$16,339.30	\$1,273.72	-----
1923	43,000.00	42,812.62	3,690.10	-----
1924	35,000.00	36,685.21	4,071.65	-----
1924 (deficiency)	3,000.00	43,183.46	3,599.45	-----
1925	42,500.00			-----
1925 (deficiency)	1,895.00	42,596.97	3,221.15	-----
1926	42,835.00	70,720.99	4,391.00	-----
1927	72,300.00	48,343.59	3,342.80	-----
1928	50,750.00			-----
1929	83,000.00			-----
Glacier:				
1917	110,000.00	108,148.16	3,202.40	\$1,352.75
1918	150,000.00	114,362.82	4,438.22	9,026.86
1919	80,000.00	79,958.69	2,624.53	(³)
1920	85,800.00	85,000.00	7,253.85	-----
1920 (deficiency)	81,849.12	81,572.94		-----
1921	95,000.00	107,847.30	10,513.20	-----
1921 (deficiency)	12,564.09			-----
1922	195,000.00	194,803.03	6,082.71	-----
1923	178,700.00	178,515.70	10,732.67	-----
1924	225,000.00	227,133.13	19,759.23	-----
1925	281,000.00	288,233.45	15,328.71	-----
1925 (deficiency)	9,260.00			-----
1926	184,960.00	172,888.11	21,311.72	-----
1927	167,745.00	167,113.23	12,020.58	-----
1928	163,300.00	162,525.28	14,652.59	-----
1929	188,200.00			-----
Rocky Mountain:				
1917	10,000.00	9,964.24	871.27	(⁹)
1918	10,000.00	9,922.10	598.75	-----
1919	10,000.00	9,993.94	307.50	-----
1920	10,000.00	9,924.85	1,507.78	-----
1921	40,000.00	39,945.40	537.25	-----
1922	65,000.00	64,923.10	2,695.41	-----
1923	73,900.00	73,153.99	3,077.08	-----
1924	74,280.00	74,000.03	582.38	-----
1924 (deficiency)	26,171.00	122,888.53	3,183.83	-----
1925	93,000.00			-----
1925 (deficiency)	4,540.00	82,259.56	2,538.35	-----
1926	84,660.00			-----
1927	87,000.00	86,100.00	2,401.88	-----
1928	97,620.00	95,612.07	924.12	-----
1929	95,500.00			-----
Hawaii:				
1919	750.00	731.40		-----
1920	750.00	747.52		-----
1921	1,000.00	125.00		-----
1922	10,000.00	9,645.16		-----
1923	10,000.00	9,969.03	775.00	-----
1924	10,000.00	9,658.74	1,460.00	-----
1925	10,000.00	9,463.09	760.00	-----
1925 (deficiency)	1,260.00			-----
1926	15,560.00	13,349.54	2,450.00	-----
1927	18,000.00	17,582.22	1,975.00	-----
1928	18,250.00	18,119.10	1,450.00	-----
1929	21,500.00			-----
Lassen Volcanic:				
1917			81.25	(³)
1918			118.05	-----
1921	2,500.00	2,410.90		-----
1922	3,000.00	2,922.41		-----
1923	3,000.00	2,963.42	228.66	-----
1924	3,000.00	2,865.61	277.27	-----
1925	3,000.00	2,957.51	170.96	-----
1925 (deficiency)	100.00			-----
1926	10,000.00	9,783.06	135.97	-----
1927	12,700.00	12,389.36	194.48	-----
1928	15,625.00	15,448.52	167.84	-----
1929	22,400.00			-----
Grand Canyon:				
1919			525.03	(³)
1920	40,000.00	39,874.27	399.32	-----
1921	60,000.00	59,948.45	8,305.43	-----
1922	100,000.00	99,966.55	4,872.02	-----

Footnotes at end of table.

NATIONAL PARKS TABLE 11.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during the fiscal years 1917-1928,¹ inclusive; also appropriations for the fiscal year 1929—Continued*

Name of the national park	Appropriations		Revenue	
	Appropriated	Expended	Received	Expended
Grand Canyon—Continued.				
1923.....	\$75,000.00	\$73,906.35	\$7,508.72	-----
1924.....	125,400.00	⁴ 124,798.40	12,655.42	-----
1925 (without year).....	100,000.00	63,757.24		-----
1925.....	116,000.00	115,908.64	12,550.06	-----
1925 (deficiency).....	4,360.00			-----
1926.....	192,360.00	189,579.00	15,806.45	-----
1927.....	132,000.00	129,288.38	41,300.12	-----
1928.....	128,760.00	128,268.33	46,097.43	-----
1929.....	169,000.00			-----
Mount McKinley:				
1922.....	8,000.00	7,792.88		-----
1923.....	8,000.00	7,850.61		-----
1924.....	8,000.00	7,730.85		-----
1925.....	11,020.00	11,497.89	68.93	(3)
1925 (deficiency).....	700.00			
1926.....	13,800.00	13,575.86	135.45	-----
1927.....	18,700.00	18,379.15	45.68	-----
1928.....	22,000.00	21,314.12	63.04	-----
1929.....	35,900.00			-----
Lafayette:				
1919.....	¹⁰ 10,000.00	9,972.42		-----
1920.....	10,000.00	9,930.06		-----
1921.....	20,000.00	19,997.73		-----
1922.....	25,000.00	24,992.99		-----
1923.....	25,000.00	24,819.20		-----
1924.....	30,000.00	29,785.89		-----
1925.....	34,700.00	37,258.20		-----
1925 (deficiency).....	2,820.00			
1926.....	34,190.00	33,636.66		-----
1927.....	34,000.00	33,463.47		-----
1928.....	37,940.00	37,376.99		-----
1929.....	39,000.00			-----
Zion:				
1917 (deficiency).....	15,000.00	14,963.81		-----
1920.....			511.50	(7)
1921.....	7,300.00	8,825.96	524.00	
1921 (deficiency).....	1,585.07			-----
1922.....	10,600.00	9,968.62	414.95	-----
1923.....	10,000.00	9,727.39	584.37	-----
1923-24 (deficiency).....	133,000.00	⁴ 144,066.88	913.25	-----
1924.....	13,750.00			
1925.....	15,190.00	⁴ 15,282.02	195.80	-----
1925 (deficiency).....	1,560.00			
1926.....	20,000.00	19,968.90	479.50	-----
1927.....	22,000.00	21,772.52	2,231.00	-----
1928.....	30,900.00	30,737.69	3,106.50	-----
1929.....	40,500.00			-----
Protection of national monuments:				
1917.....	3,500.00	2,586.66		-----
1918.....	5,000.00	4,832.70	225.00	(11)
1919.....	10,000.00	9,473.10	320.75	
1920.....	8,000.00	7,802.92	123.50	-----
1921.....	8,000.00	7,838.99	123.20	-----
1922.....	12,500.00	12,019.98	39.00	-----
1923.....	12,500.00	11,385.55	135.38	-----
1924.....	12,500.00	11,774.15	23.50	-----
1925.....	20,750.00	21,179.10	57.00	-----
1925 (deficiency).....	1,230.00			
1926.....	46,980.00	46,752.31	72.00	-----
1927.....	21,270.00	20,867.25	66.00	-----
1928.....	25,000.00	24,042.56	132.00	-----
1929.....	35,000.00			-----
Casa Grande National Monument:				
1917.....	900.00	(12)		-----
1918.....	900.00	(12)		-----
1919.....	900.00	(12)		-----
Improvement of Navajo National Monument, Ariz.: 1917.....	¹³ 3,000.00	1,962.69		-----
Carlsbad Cave National Monument:				
1926.....	(14)		3,718.00	-----
1927.....	15,000.00	14,663.81	32,628.00	-----
1928.....	30,000.00	28,492.84	55,682.00	-----
1929.....	70,000.00			-----

Footnotes at end of table.

NATIONAL PARKS TABLE 11.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during the fiscal years 1917-1928,¹ inclusive; also appropriations for the fiscal year 1929—Continued*

Name of the national park	Appropriations		Revenue	
	Appropriated	Expended	Received	Expended
National Park Service:				
1917	\$3,666.67	\$2,513.62		
1918	17,600.00	17,413.33		
1919	19,200.00	19,177.50		
1920	22,220.00	21,524.46		
1921	27,420.00	27,090.59		
1922	31,020.00	30,957.72		
1923	32,420.00	32,383.50		
1924	33,200.00	32,922.67		
1925	44,000.00	46,632.92		
1925 (deficiency)	2,700.00			
1926	51,000.00			
1927	55,680.00	55,678.63	\$94.00	
1928	57,100.00	57,047.56	20.10	
1929	70,200.00			
Fighting forest fires:				
1922	25,000.00	9,618.30		
1923	25,000.00	17,764.16		
1924	25,000.00	6,526.02		
1925	20,000.00	20,000.00		
Emergency reconstruction: 1925	20,000.00	17,009.15		
Emergency reconstruction and fighting forest fires:				
1926	40,000.00	80,000.00		
1926 (deficiency)	40,000.00			
1927	40,000.00	40,000.00		
1927 (deficiency)	235,000.00	225,930.59		
1928	40,000.00	¹⁰ 26,865.46		
Accounting services:				
1923	6,000.00	5,216.60		
1924	6,000.00	5,992.11		
1925	6,000.00	5,564.15		
1926	6,000.00	5,899.19		
1927				
1928	6,000.00	5,835.71		
Construction of roads and trails:				
1925 (deficiency)	1,000,000.00	995,200.61		
1926	1,500,000.00	1,500,000.00		
1927	2,000,000.00	2,000,000.00		
1928	2,000,000.00	2,000,000.00		
1928 (deficiency)	1,000,000.00			
1929	2,500,000.00			
Insect control:				
1925-26 (deficiency)	25,000.00	24,945.24		
1927	20,000.00	18,344.47		
1928	7,500.00	7,379.35		
Southern Appalachian:				
1925-26 (deficiency)	20,000.00	12,453.27		
1927	⁽¹⁵⁾	7,252.21		
1928	5,000.00	¹⁶ 3,887.13		
1929	4,500.00			
Purchase of lands:				
1928	50,000.00	13,925.00		
1929	50,000.00			

¹ For statement of appropriations and revenues prior to 1917 see 1920 Annual Report, pp. 354-358.

² Made available during fiscal years 1920 and 1921 by sundry civil acts approved July 19, 1919 (41 Stat. 204), and June 5, 1920 (41 Stat. 918).

³ Expenditure of revenue for park purposes not authorized. Sundry civil act of June 12, 1917 (40 Stat. 153); Hot Springs, act of May 24, 1922 (42 Stat. 590).

⁴ Appropriation transfer. See Table 13.

⁵ Includes \$15,855 from sale of lots in 1923; \$3,500 in 1925.

⁶ Unexpended balance of 1918 War Department appropriation of \$20,000 made available under Interior Department during 1919. Sundry civil act of July 1, 1918 (40 Stat. 678).

⁷ For purchase of private holdings.

⁸ Made available during 1925, act of Mar. 4, 1925 (43 Stat. 1331).

⁹ Expenditure of revenues from Mesa Verde and Rocky Mountain Parks for park purposes not authorized by statute.

¹⁰ Appropriation for 1919 made under the name of Sieur de Monts National Monument.

¹¹ Expenditure of revenue for monument purposes not authorized.

¹² Expended under the direction of the Commissioner of the General Land Office.

¹³ Expended under direction of Smithsonian Institution.

¹⁴ \$5,000 and \$25,000 of appropriation for protection of national monuments for 1925 and 1926, respectively, specifically made available for Carlsbad Cave.

¹⁵ Unexpended balance of 1925-26 appropriation made available for expenditure in 1927. Act of July 3, 1926 (44 Stat. 857).

¹⁶ \$35,000 reappropriated and made available for expenditure in Yosemite during fiscal year 1929; \$1,112.87 reappropriated and made available for expenditure for Southern Appalachian during fiscal year 1929; \$13,134.50 reappropriated and made available for expenditure for emergency reconstruction and fighting forest fires during fiscal year 1929.

NATIONAL PARKS TABLE 12.—*Summary of appropriations for the administration, protection, and improvement of the national parks and national monuments, together with the revenues received, for the fiscal years 1918¹–1929, inclusive*

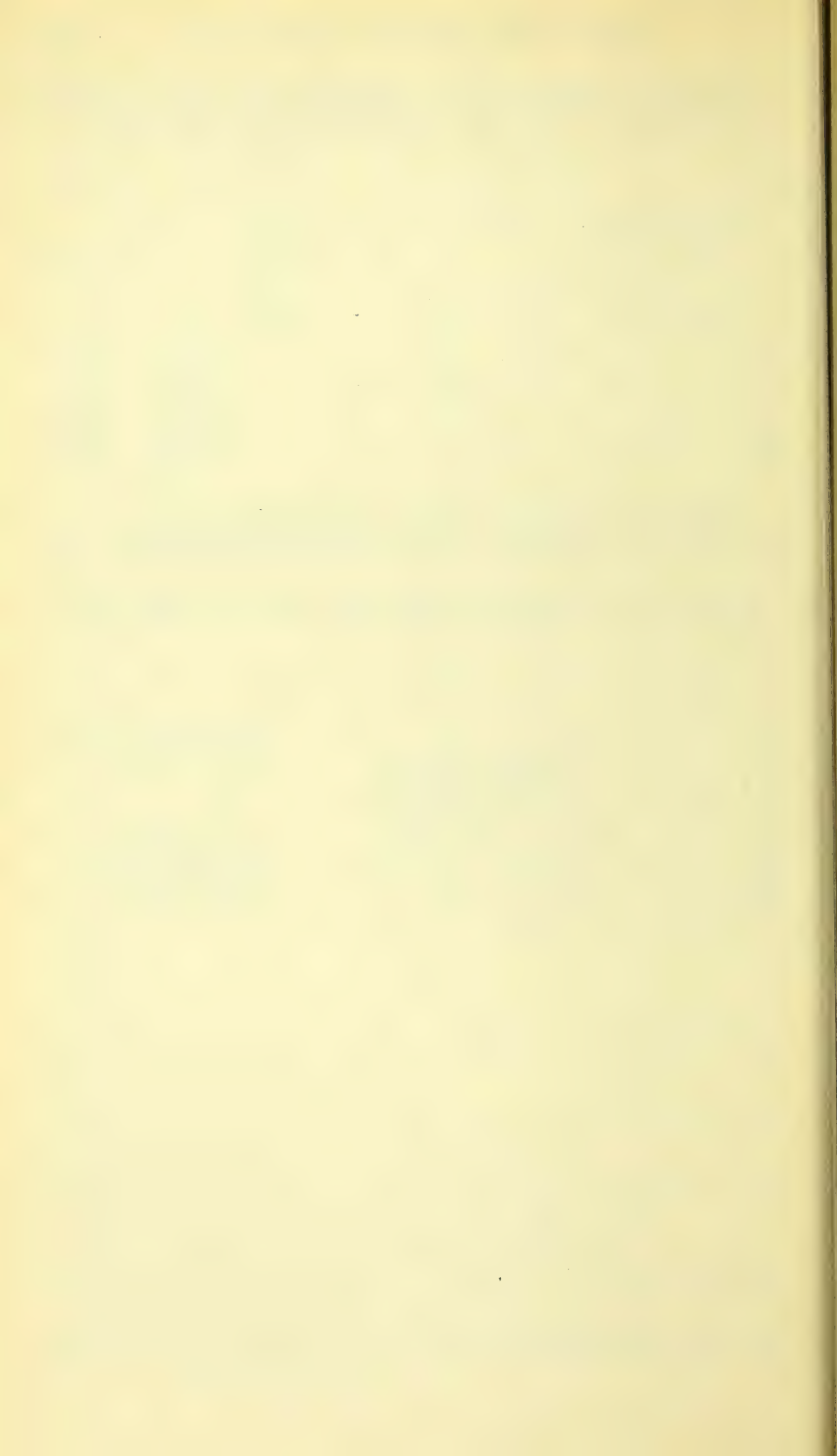
Year	Department	Appropriation	Revenues
1917	Interior Department.....	\$537,366.67	
	War Department.....	247,200.00	
1918	Interior Department.....	530,680.00	\$784,566.67
	War Department.....	217,500.00	
1919	Interior Department.....	963,105.00	748,180.00
	War Department.....	50,000.00	² 217,330.55
1920	.....	1,013,105.00	196,678.03
1921	.....	907,070.76	316,877.96
1922	.....	1,058,969.16	396,928.27
1923	.....	1,433,220.00	432,964.89
1924	.....	1,446,520.00	513,706.36
1925	.....	1,892,601.00	663,886.32
1926	.....	3,027,657.00	670,920.98
1927	.....	3,258,409.00	826,454.17
1928	.....	3,698,920.00	703,849.60
1929	.....	4,889,685.00	808,255.81
	.....	4,659,700.00	.....

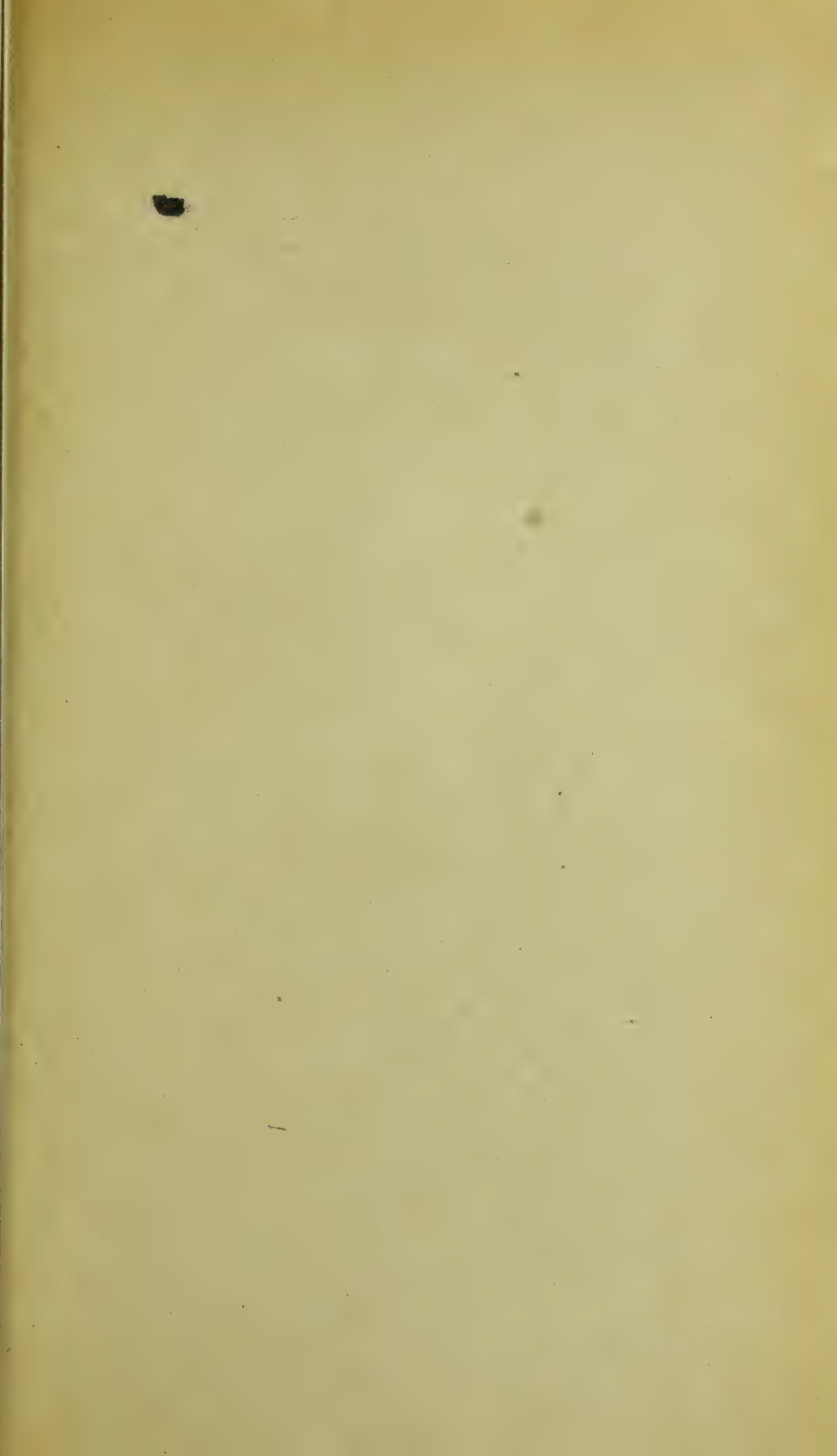
¹ For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.

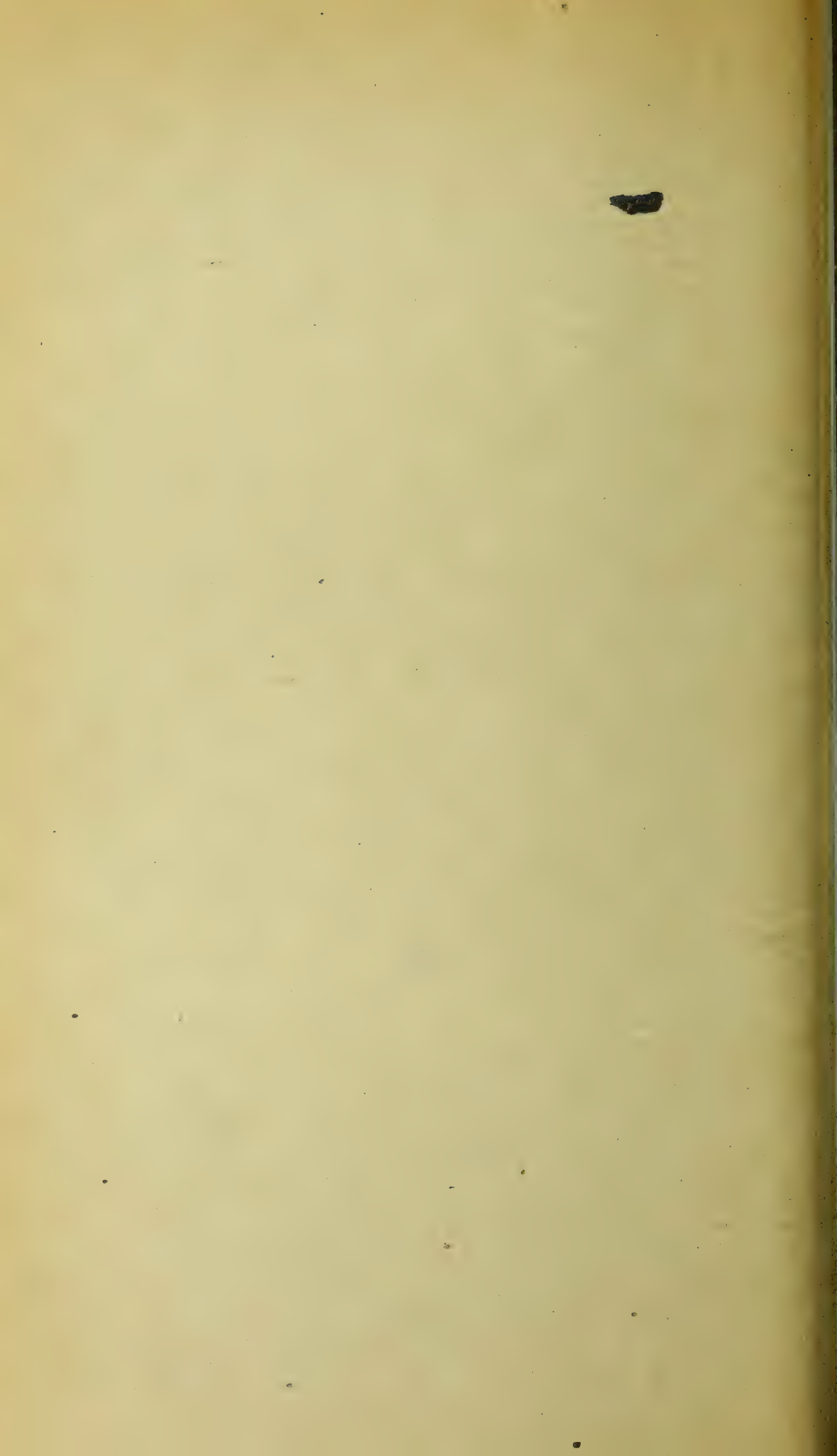
² The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 13.—*Statement of amounts transferred under the authority contained in the appropriation acts to transfer 10 per cent from one appropriation to another*

Year	Amount	From—	To—
1924.....	\$3,000	Yosemite National Park.....	Mount Rainier National Park.
1924.....	1,000	do.....	Mesa Verde National Park.
1924.....	1,000	Zion National Park.....	Do.
1924.....	1,900	Mesa Verde National Park.....	Glacier National Park.
1924.....	800	Grand Canyon National Park.....	Do.
1924.....	200	Yellowstone National Park.....	Do.
1925.....	1,000	Hot Springs National Park.....	Zion National Park.
1925.....	500	Grand Canyon National Park.....	Do.
1926.....	1,000	Yellowstone National Park.....	Wind Cave National Park.
1926.....	913	do.....	Sequoia National Park.
1926.....	1,062	Rocky Mountain National Park.....	Mount Rainier National Park.
1927.....	200	Grand Canyon National Park.....	Sequoia National Park.
1928.....	200	do.....	Wind Cave National Park.
1928.....	450	Yellowstone National Park.....	Do.







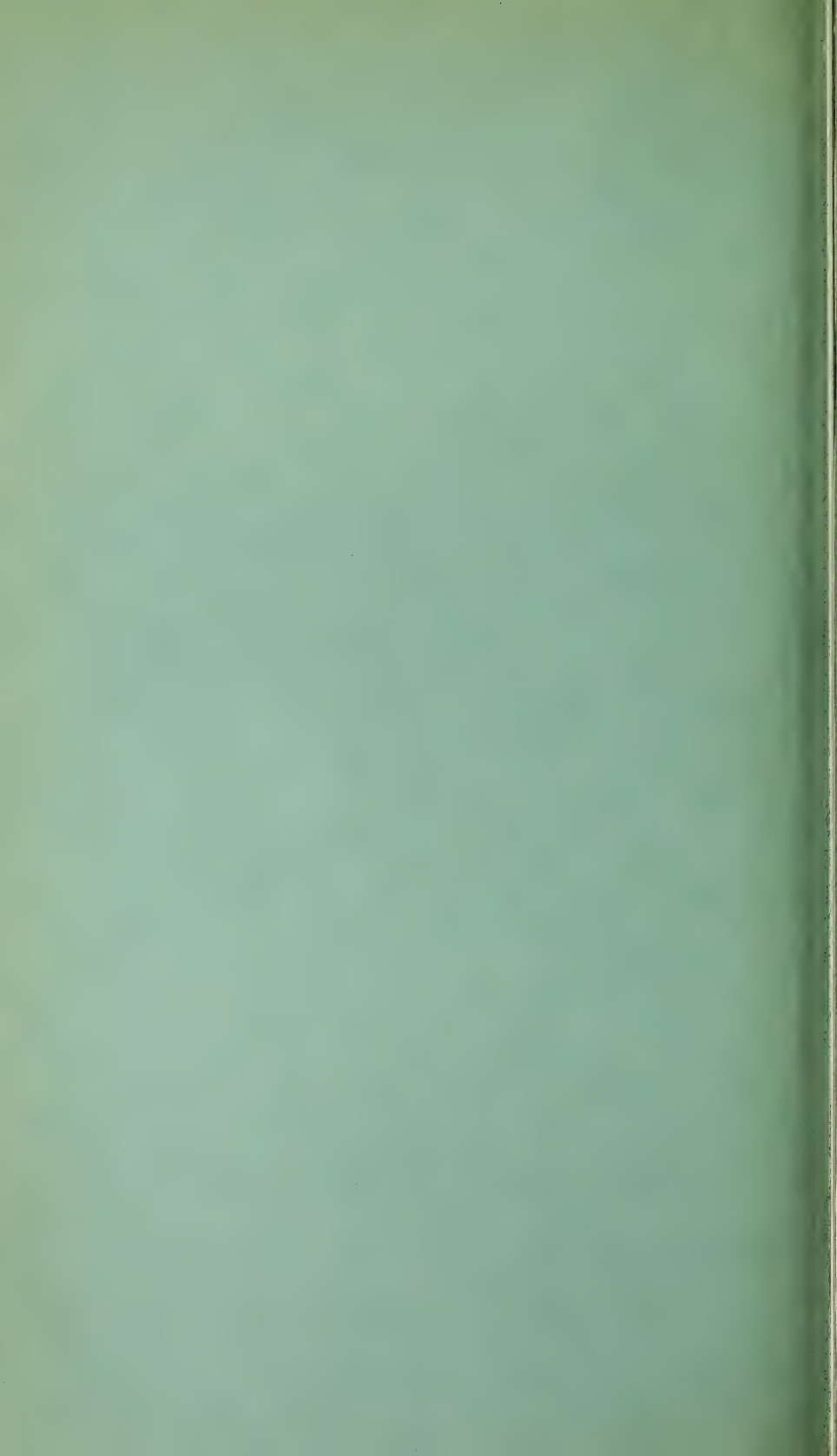
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OF THE INTERIOR

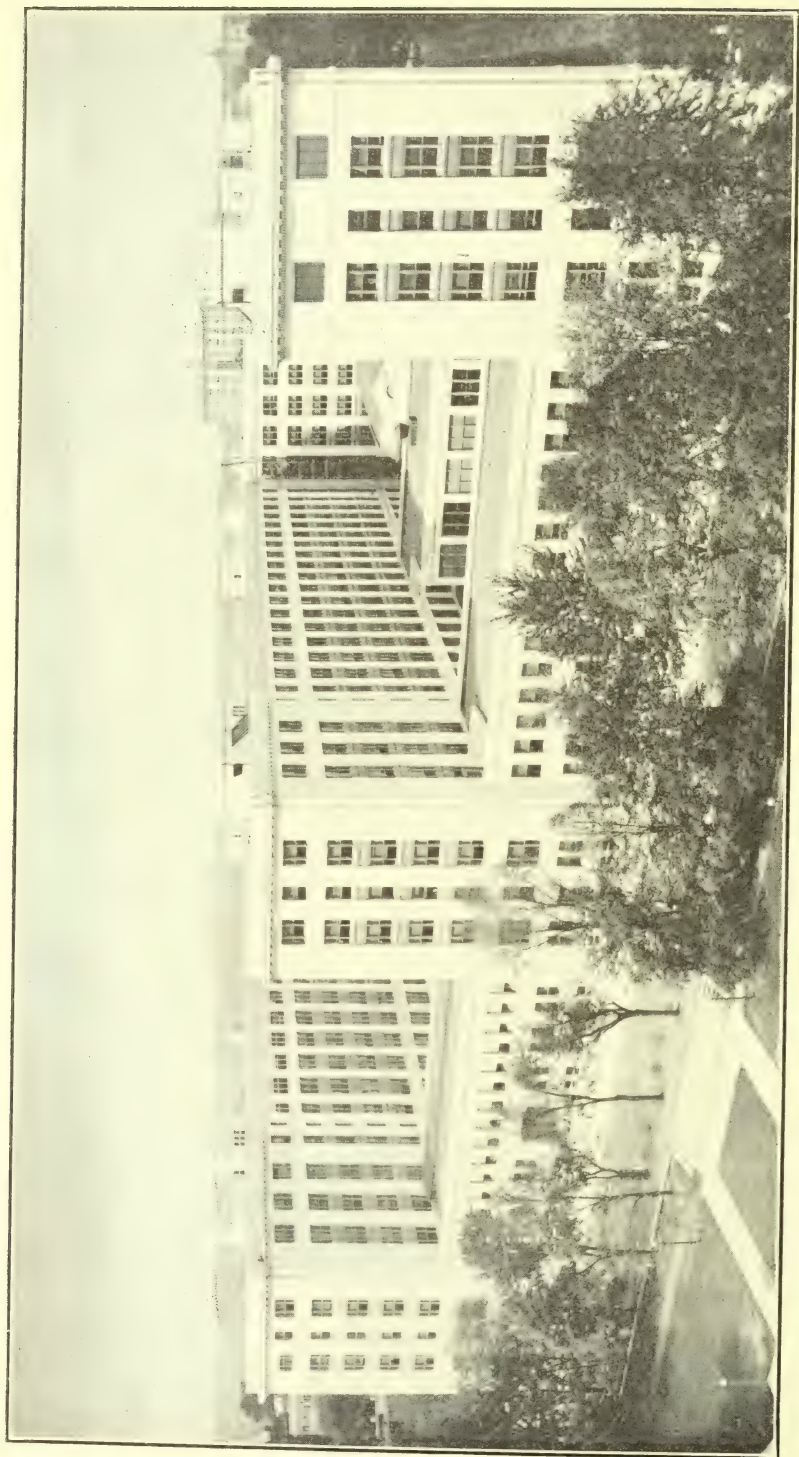
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INTERIOR DEPARTMENT BUILDING

ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR



FOR THE FISCAL YEAR ENDED JUNE 30

1929



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1929



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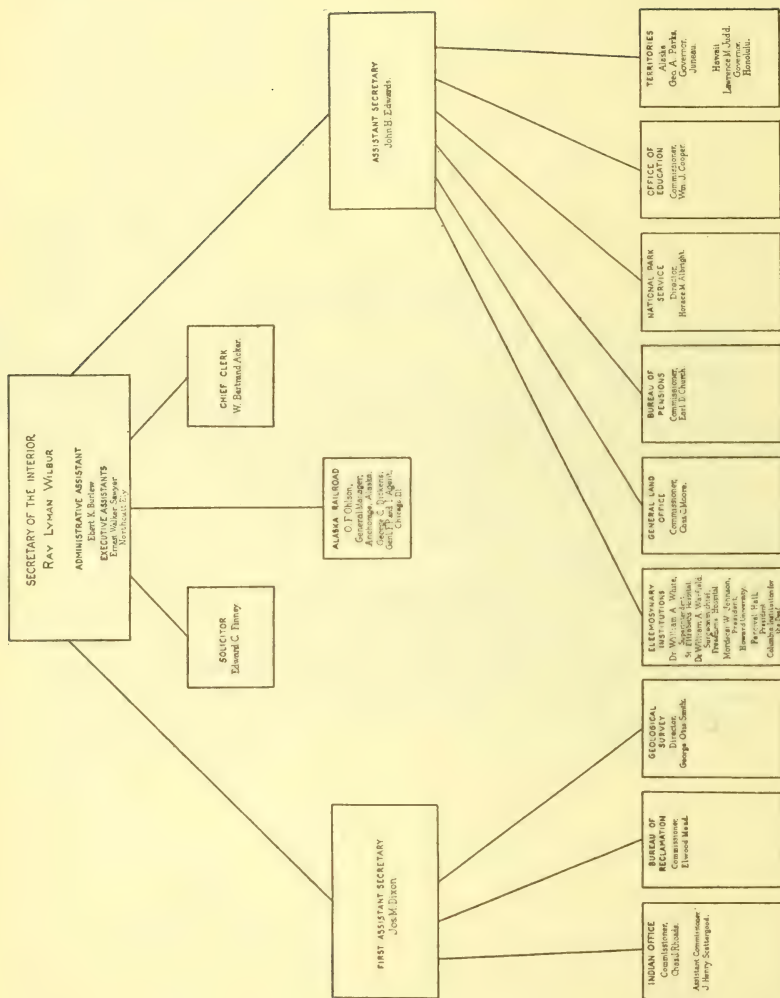
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ORGANIZATION CHART

OFFICERS OF DEPARTMENT OF THE INTERIOR

Office of the Secretary:

<i>Secretary of the Interior</i> -----	RAY LYMAN WILBUR.
<i>First Assistant Secretary</i> -----	JOSEPH M. DIXON.
<i>Assistant Secretary</i> -----	JOHN H. EDWARDS.
<i>Administrative Assistant</i> -----	EBERT K. BURLEW.
<i>Executive Assistant</i> -----	ERNEST W. SAWYER.
<i>Executive Assistant</i> -----	NORTHCUTT ELY.
<i>Assistant Administrative Officer</i> -----	GEORGE E. SCOTT.
<i>Chief Clerk of the Department</i> -----	WM. BERTRAND ACKER.

Office of the Solicitor:

<i>Solicitor</i> -----	EDWARD C. FINNEY.
<i>Assistant to the Solicitor</i> -----	ORLIN H. GRAVES.
<i>Member, Board of Appeals</i> -----	GEORGE B. GARDNER.
<i>Member, Board of Appeals</i> -----	WILLIAM B. NEWMAN.
<i>Member, Board of Appeals</i> -----	ALVAH W. PATTERSON.

The Bureaus:

<i>Commissioner of the General Land Office</i> -----	CHARLES C. MOORE.
<i>Assistant Commissioner, General Land Office</i> -----	THOMAS C. HAVELL.
<i>Commissioner of Indian Affairs</i> -----	CHARLES J. RHOADS.
<i>Assistant Commissioner of Indian Affairs</i> -----	J. HENRY SCATTERGOOD.
<i>Commissioner of Pensions</i> -----	EARL D. CHURCH.
<i>Deputy Commissioner of Pensions</i> -----	EDWARD W. MORGAN.
<i>Commissioner of Education</i> -----	WM. JOHN COOPER.
<i>Assistant Commissioner of Education</i> -----	MISS BESS GOODYKOONTZ.
<i>Director of the Geological Survey</i> -----	GEORGE OTIS SMITH.
<i>Commissioner of Reclamation</i> -----	ELWOOD MEAD.
<i>Assistant Commissioner of Reclamation</i> -----	PORTER W. DENT.
<i>Director of the National Park Service</i> -----	HORACE M. ALBRIGHT.
<i>Associate Director, National Park Service</i> -----	ARNO B. CAMMERER.

The Territories:

<i>Governor of Hawaii</i> -----	LAWRENCE M. JUDD.
<i>Governor of Alaska</i> -----	GEORGE A. PARKS.
<i>General Manager, the Alaska Railroad</i> -----	OTTO F. OHLSON.

Institutions:

<i>Superintendent, St. Elizabeths Hospital</i> -----	DR. WILLIAM A. WHITE.
<i>Surgeon-in-chief, Freedmen's Hospital</i> -----	DR. WILLIAM A. WARFIELD.
<i>President, Howard University</i> -----	MORDECAI W. JOHNSON.
<i>President, Columbia Institution for the Deaf</i> ---	DR. PERCIVAL HALL.

FUNCTIONS OF THE DEPARTMENT OF THE INTERIOR

The United States Department of the Interior, established by the act of March 3, 1849 (9 Stat. 395), is the land, home, and education department of the Government. Its work is a permanent contribution to the educational, scientific, historical, and conservation functions of the Government. It is a fact-finding department for internal development. Its mission is largely educational and many of its activities are devoted to the discovery and dissemination of knowledge. It contributes to education through its Office of Education. It operates directly 205 schools for the American Indians and 86 for the native Alaskans. It maintains Howard University, training schools for nurses at Freedmen's and St. Elizabeths Hospitals, with a graduate school for psychiatrists at the latter, and the Columbia Institution for the Deaf. Its work in the General Land Office, Geological Survey, and the Bureau of Reclamation touches the scientific field; through the National Park Service it handles the national playgrounds of the people; and through the Pension Office it handles large financial transactions involved in the payment of pensions to veterans of the wars.

GENERAL LAND OFFICE.—Originally organized as a bureau of the Treasury Department under the act of April 25, 1812 (2 Stat. 716), and transferred to the Interior Department in 1849, the General Land Office has control of the public lands, including their survey, handling applications for homesteads and Indian allotments, desert land and mining claims, and mineral leases. Has jurisdiction over granting railroad and other rights of way and easements on public lands and adjusting State and railroad land grants.

OFFICE OF INDIAN AFFAIRS.—Originally organized as a bureau of the War Department under the act of July 9, 1832 (4 Stat. 564), and transferred to the Interior Department in 1849. Acts as the official guardian of the Indians; promotes their health and physical welfare; directs the education of Indian children; encourages their native arts and crafts; reclaims their lands and develops the natural resources in timber and minerals; supervises their funds; adjusts heirship matters and handles all Indian affairs of the Government.

BUREAU OF PENSIONS.—Originally organized as a bureau of the War Department under the act of March 2, 1833 (4 Stat. 622) and made a part of the Interior Department in 1849. Handles the pension claims and pays pensions for all the wars of the United States except the World War. Administers the civil service retirement act, handling and paying annuities to retired employees of the Government.

OFFICE OF EDUCATION.—Established as a department under the act of March 2, 1867 (14 Stat. 434), and became a bureau of the Interior Department in 1869 (15 Stat. 106). Further education by the compilation and dissemination of data covering education in the United States and foreign countries; conducts university, college, and school surveys, including experiments in education; operates Government schools for the natives of Alaska.

GEOLOGICAL SURVEY.—Established under the act of March 3, 1879 (20 Stat. 394). Makes topographic and geological maps of the United States and Alaska; studies the surface and underground water resources; prepares and distributes

reports on gold, silver, petroleum, and other mineral deposits; and, through a conservation branch, classifies public lands and supervises engineering phases of mineral leasing.

BUREAU OF RECLAMATION.—Established under the act of June 17, 1902 (32 Stat. 388), for the purpose of developing agricultural possibilities of the arid and semiarid regions of the United States. This bureau constructs and operates irrigation works; collects annual payments from water users for cost of irrigation; promotes knowledge of irrigation methods, suitability of crops, availability of markets, and improvement of farm homes.

NATIONAL PARK SERVICE.—Established by the act of August 25, 1916 (39 Stat. 535), this bureau conserves the natural beauties and unique characteristics of the national parks and monuments under its control and promotes their use for the health and recreation of the people. It also protects and restores ruins of ancient civilization and the flora and fauna of the parks.

ALASKA RAILROAD.—Construction authorized by Congress under the act of March 12, 1914 (38 Stat. 305), and completed in 1923 at a cost of \$60,000,000. This Government owned and operated road extends for a distance of 467 miles into the interior of Alaska, transporting passengers, freight, express, and mail.

ST. ELIZABETHS HOSPITAL.—Established under the act of March 3, 1855 (10 Stat. 682), this is a class A institution for the treatment of mental diseases of the Army, Navy, and District of Columbia. The daily average number of patients treated is 4,200, and its average number of employees is 1,280.

FREEDMEN'S HOSPITAL.—Established under the control of the War Department by act of March 3, 1871 (16 Stat. 506), and transferred to Interior Department by act of June 23, 1874 (18 Stat. 223). This hospital provides medical and surgical treatment for the colored race, its patients including indigent residents of the District of Columbia, residents of the several States, emergency cases, and regular pay patients. It cares for approximately 4,318 indoor patients and 10,984 outdoor patients annually.

HOWARD UNIVERSITY.—Established by the act of March 2, 1867 (14 Stat. 438), this is an institution of higher education of the colored youth of the Nation in liberal arts and sciences, medicine, law, and religion. The enrollment of students is over 2,000 annually, with 273 graduates every year.

COLUMBIA INSTITUTION FOR THE DEAF.—Established under the act of February 16, 1857 (11 Stat. 161). This institution cares for deaf mutes of the States and Territories and the District of Columbia. It reports annually to the Secretary of the Interior and certain of its beneficiaries are admitted to the institution under that officer.

TERRITORIES.—Alaska and Hawaii are directly represented by the Secretary of the Interior in the official family of the President, many of various Federal activities in these Territories being under his supervision.

LETTER OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR,
Washington, D. C., November 20, 1929.

SIR: I have the honor to transmit my annual report on the operations of the Interior Department for the fiscal year 1929, ended June 30, 1929.

This report, dating from July 1, 1928, covers the administration of the Hon. Hubert Work, as Secretary, until his resignation on July 24, 1928, and the administration of the Hon. Roy O. West, from July 25, 1928, to March 4, 1929. I am pleased to take this opportunity to express my appreciation of their work as evidenced by the condition of the department when I took office on March 4.

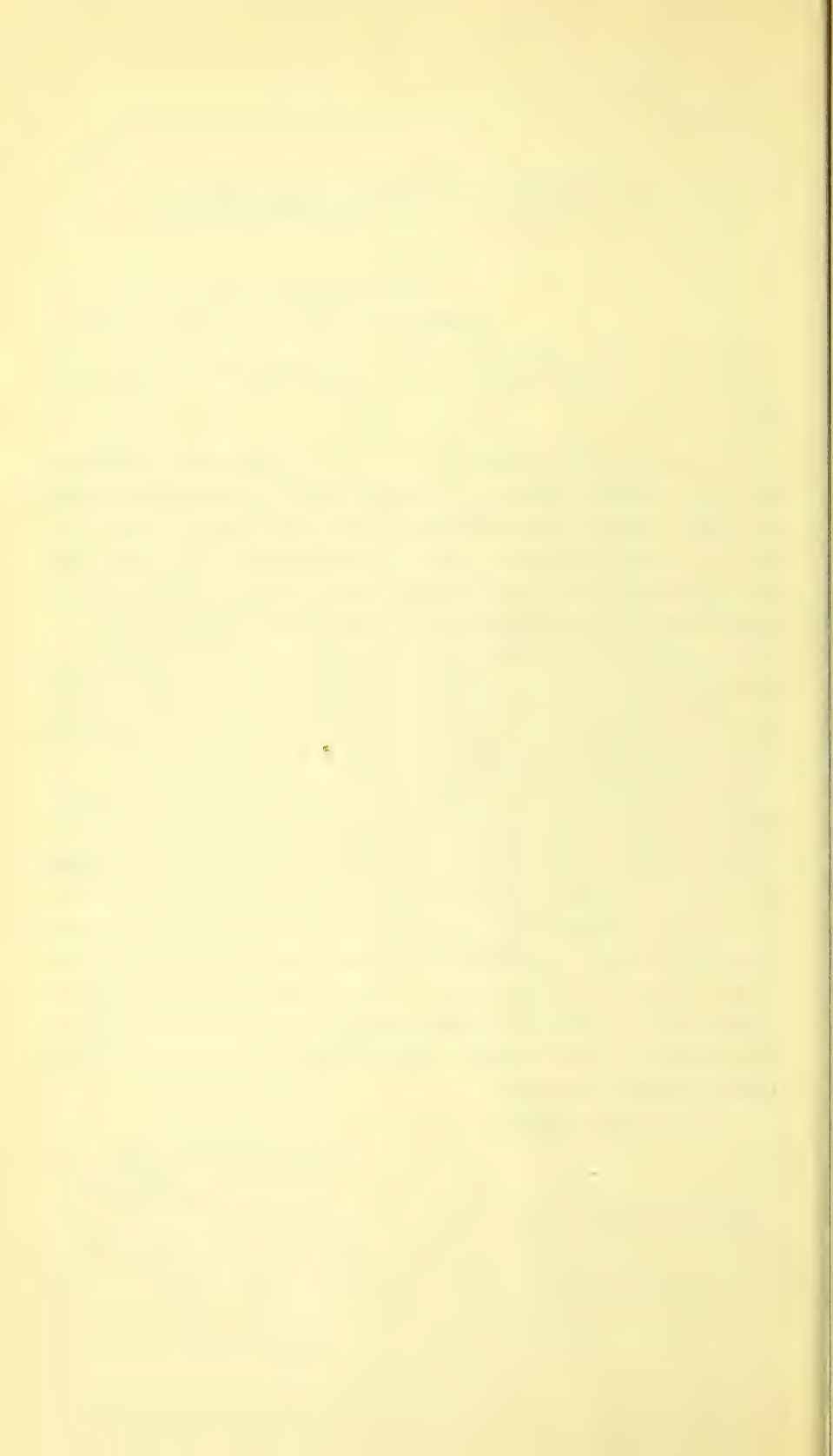
The past year's achievements, as shown by the reports of the bureaus, Territories, and independent establishments under this department's jurisdiction, may be found summarized in this report under the heading, The Year's Work in Brief.

In the Foreword I have attempted to state the policies formulated for the future. Five of this department's bureaus deal directly with Federal lands. The future of the public domain, with its attendant problems of water conservation and the conservation of mineral resources, is consequently a major responsibility. In other bureaus, changing national conditions have necessitated a shift of emphasis. In the Foreword of this report I have endeavored to indicate the perspective in which I view the various lines of service in which the Department of the Interior is engaged and the directions in which these activities will move.

Very respectfully,

RAY LYMAN WILBUR,
Secretary.

The PRESIDENT.



REPORT OF THE SECRETARY OF THE INTERIOR

PART I: FOREWORD

THIS is a period of changing emphasis in the work of this department. Some of the great bureaus, particularly the Bureau of Pensions and the General Land Office, have overtaken the peak of their administrative load under existing legislation. Other bureaus, such as the Geological Survey and the Bureau of Reclamation, have ahead of them large tasks for completion. One activity, that of the Indian Service, has before it a definite and unique goal—that of working itself out of a job. Its program calls for a large economic saving to the country by increased present expenditures to enable the Indian population to eventually become self-supporting. On the other hand, the National Park Service and the Office of Education look forward to constantly increasing fields of activity. The Territorial administration of Hawaii and Alaska is vested in this department and their problems present an expanding opportunity. The work of this department and its component organizations embraces a more diversified field than that of other Government departments. The public domain, water power, oil, pensions, the work of mapping the country, reclamation of arid lands, the national parks, the Government's part in the educational work of the country, care of the persons and property of over 350,000 Indians, contact with two great Territories and the administration of four eleemosynary institutions and six collateral activities—these all bring their varied problems into one administrative area. The correlation of their work, establishment of a proper perspective on their various interests and financial requirements, and the establishment of major policies devolve upon the Secretary of the Interior. These policies for the ensuing year may be briefly stated as follows:

PERSONNEL

The morale of the men and women of this department is on a constantly rising plane. At the head of each bureau there is now a man enthusiastic about his work and upon whom rests the responsibility for having his bureau function. The same efficiency and initiative will be expected of their subordinates as would be the case in a commercial organization and, so far as legal and financial restrictions will permit, recognition and advancement will be based upon the same standards. This department is organized on a basis whereby, with but few exceptions, the administrative unit is a division or a branch responsible to a bureau chief, styled commissioner or director. These, in turn, are responsible to either the First Assistant Secretary, the Assistant Secretary, the solicitor, or the chief clerk.

The department embarks on the coming year with some changes in its personnel.

In recognition of the increasing importance of the legal questions coming before the department, Mr. Edward C. Finney, First Assistant Secretary, a lawyer of unparalleled experience in the administration of the public land laws, was asked to assume the responsibilities of the solicitor for the department, and now occupies that post. Former Governor and Senator Joseph M. Dixon, of Montana, was appointed to the office of First Assistant Secretary. His experience in western problems and in Washington legislation and administration have fitted him for his present supervision over the Bureau of Reclamation, the Geological Survey, and the Indian Service. John H. Edwards continues as Assistant Secretary. His responsibilities include the Territories, the Office of Education, the National Park Service, the Bureau of Pensions, the General Land Office, and the eleemosynary institutions located at Washington.

There have been important changes in the leadership of the bureaus. Death brought one of them. Former Gov. William Spry, of Utah, Commissioner of the General Land Office, died at his post. His faithful administration of the General Land Office under three administrations entitled him to a high place in the records of this department; the respect held for him by his associates and the affection he commanded among the men and women whom he led have not been surpassed in this department. He was succeeded by former Gov. C. C. Moore, of Idaho.

ERRATA

“William J. Scattergood,” page 5, paragraph 3, line 22, should read “J. Henry Scattergood.”



Ill health, occasioned largely by self-sacrificing devotion to his work, necessitated another change when Stephen T. Mather tendered his resignation as Director of the National Park Service after nearly 12 years' service. He was succeeded by Horace M. Albright, one of his associates, superintendent of Yellowstone National Park, and Assistant Director of the Park Service. In regretfully accepting Director Mather's resignation, Secretary West expressed the debt of gratitude owed to him by the Nation for his years of self-sacrificing and constructive service. I was associated with Mr. Mather in some activities, and I am pleased to join Secretary West's appraisal of his achievements.

The Bureau of Pensions, upon termination of the service of Col. Winfield Scott as commissioner, passed under the jurisdiction of Col. Earl D. Church, whose experience in insurance administration affords a sound basis for formulating the policies of that bureau.

The Commissioner of Indian Affairs, Charles H. Burke, resigned after a period of service extending over a longer time than that of any predecessor and including some of the most difficult stages of Indian administration. His work was courageous and energetic. The drafting into service of Charles J. Rhoads, of Philadelphia, in collaboration with William J. Scattergood, as assistant commissioner, marks the beginning of a new period. Both are men of large business experience whose interest in the Indian has extended over many years. They sacrificed personal interests to accept a large responsibility.

The governorship of Hawaii passed with the resignation of Wallace R. Farrington to Lawrence M. Judd. The prosperity of the island is reflected in its annual report, an abstract of which is given in another part of this report, and which testifies to the efficiency of Governor Farrington's administration.

George A. Parks continues his effective administration as Governor of Alaska, with O. F. Ohlson as general manager of the Alaska Railroad.

The Bureau of Reclamation remains under the direction of Commissioner Elwood Mead, who is charged with the task of building Boulder Dam.

The Geological Survey continues under the leadership of Director George Otis Smith.

The Commissioner of Education is William John Cooper, who took office upon the resignation of John J. Tigert, during the prior administration.

Ebert K. Burlew continues as Administrative Assistant and Northcutt Ely as Executive Assistant to the Secretary. Ernest Walker Sawyer, Executive Assistant, will transfer his association to the Alaska Railroad in an executive capacity.

W. Bertrand Acker continues as chief clerk, a position for which his long administrative experience qualifies him.

THE PUBLIC DOMAIN

Save for the national forests and some reservations, the public domain comprises in its limits the last of our nationally owned resources. Correlation of conservation of these national resources with the welfare of the people living in the public-land States presents a problem engaging the activities of five of this department's bureaus: The General Land Office, the Office of Indian Affairs, the Geological Survey, the Bureau of Reclamation, and the National Park Service. With the exception of the Office of Indian Affairs, the future of the public domain rests in the wise direction of the activities of these bureaus. As most of the public domain lies in arid or semiarid regions, the principal problem is one of water conservation, and the solution of this problem in the arid regions carries with it a large part of the fate of the cultivated areas lying in the same watersheds. The problem is not one solely of reclamation but of protection against erosion on unreclaimed watersheds. Water conservation may properly rank first in the administration of the public domain, because of its importance in the everyday lives of the people in these States; but equally imperative from the national viewpoint is the necessity for wise use of the mineral resources, principally petroleum, which still remain within Federal jurisdiction.

Water conservation

Those who depend upon the regular rains of the summer have no conception of irrigation and its peculiar responsibilities. It demands communal living and thinking and peaceful conditions for people to join in together to finance and maintain large water-distributing systems. Even the control of the flow of water from a single ditch

demands rigid cooperation and fair play. From Nebraska west, water, and water alone, is the key to our future. We need the mountains and the hills and a great protective back country or we can not have sufficient water for our valleys. The cooperation and fair play that have made possible the successes of individual reclamation undertakings must be extended to the larger problem. Homestead thinking must be replaced with watershed thinking. There must be a great western strategy for the protection of our watersheds and the plant life on them, however undesirable and unimportant some of it may seem to be. A cactus or sage brush that has fought its way to maturity against drought plays its part in furthering rainfall and in stopping soil erosion. Overgrazing by sharp-nosed animals cuts down the plant life, increases erosion, buries water holes, increases flood damage, and is harmful to water conservation. Plants hold the snow and the rain, prevent rapid run-off and soil erosion, and build a balanced set of natural conditions, which can only be broken at the peril of those bringing it about. The public domain has been abused, overgrazed, and not respected in many sections of the country. Unless we care for the lands now in possession of the United States, in forests and public domain, the West will repeat the degradation of Korea and parts of China with man-made barrenness, floods, erosion, and decay. We must stop thinking in terms of immediate production in viewing much of the public land of to-day. The forests must be protected or harvested constructively, overgrazing must be stopped, and experts in plant life and water conservation must be our guides. It is difficult to understand and properly control such problems from Washington.

These considerations have made the Presidential appointment of a commission to study the public lands question, under the chairmanship of former Secretary Garfield, essential and timely.

This commission will consider the question of desirability of transfer to the State governments of the remaining unappropriated unserved public lands for school purposes, thus placing these lands under State administration. These unappropriated lands now total about 190,000,000 acres. The public lands embraced in about 10,000,000 acres, withdrawn as stock watering places and for stock drives, might also be subject to transfer. In addition the surface rights of about 35,000,000 acres of coal and shale reserves should

also be eligible. The grazing value of all these lands has steadily decreased, due to overgrazing. Their deterioration will necessarily ultimately affect the water supply through destruction of the soil. This loss is in addition to the decreased value for grazing. The trees, grass, and desert growth essential to the preservation of the soil know nothing about the jurisdiction charged with their protection. The problem is not a theoretical one of whether the Federal or State Government should administer them but a practical one of whether local understanding or distant direction shall be the controlling factor. The States have already shown their capacity to handle school lands ceded to them. The President's proposal does not include such forest, park, Indian, and similar reservations as have a national, as well as local, importance.

With regard to mineral rights, inasmuch as the great bulk of revenues collected by the United States revert to the States, either directly or through the reclamation fund, and inasmuch as Federal expenditures for the Geological Survey and similar organizations for the development of the mineral resources and the public domain have far exceeded the Government's proportion of receipts, no hardship will result to the States from the continued administration of these national assets by the National Government.

Reclamation

Reclamation is but one phase of the problem of water conservation. It is generally agreed that the engineering undertakings of the Bureau of Reclamation have been soundly conceived and well carried out. But the problem is broader than its engineering phases. This country has produced too much of some kinds of food and with the industrialization and urbanization of a growing percentage of our people there has also been a shift in the type of foods eaten. This, together with a greater productiveness of favored areas with the help of better seed, better methods, and more machinery, has increased the amount of so-called marginal lands where the farmer's life is a struggle against heavy odds. I know of no more painful act than to place a man and particularly his wife on a piece of land where they are foreordained to a prolonged agonizing failure. The economics of a new farm project must be essentially sound or a social crime is in prospect. Economic surveys, recently made under the direction of the Bureau of Reclamation, have been of value. Reclama-

tion has been a sound policy of the National Government; to continue so, under changing conditions, will require some changes in view and increased emphasis upon the economic aspects of new projects.

The President has expressed a desire to see a recasting of the activities of the Reclamation Service with reference to new projects in view of the diminishing ratio of public domain to privately owned lands in possible future irrigation projects. The proposal is to carry Government participation only to the building of dams and water-storage works and thereupon transfer the works to the States for development of distribution systems without obligation for repayment, except such revenue as may arise from electrical power and, in some cases, from the sale of water. This problem also will come before the new public lands commission for study and I propose to cooperate with it to this end. Administration of established projects would not, of course, be affected.

Mineral resources

Conservation of the Nation's remaining mineral resources presents a problem in administration of the public domain second only to the conservation of water. Petroleum is our fastest-dwindling irreplaceable asset. It is acknowledged that there is considerable preventable waste in the handling of our oil supplies. This is due to the waste of gas and oil, the use of gasoline-containing crude oils in other than gasoline engines, the large amounts left in the ground because of badly managed attacks upon the pools, and wastage from evaporation due to expensive storage above ground. It is also acknowledged that there is a limited supply of oil available. Estimates vary but those most expert in the field expect our present volume of production to last for less than a decade. This situation, in view of the proportionately small known petroleum areas still controlled by the United States, presents squarely to the Government the problem of wise use of this remaining supply. Primarily, the responsibility for the prevention of waste lies with the industry and with the governments of the States. That problem is far from solution. The position of the Federal Government is not to interfere with the rights and duties of the local State governments but to lend such aid

as it can and to participate in the solution of the problems. Voluntary cooperation in the industry and wise exercise of the police power by the States must be the basis for conservation. Until the present day of wasteful overproduction is over the potential supply in the public domain must be safeguarded. With that need in view, the issuance of prospecting permits has ceased and extensions of existing permits have been granted only upon a showing of equities.

Unsound exploitation of the public domain under oil prospecting permits has, in some cases, been shocking. Although the law allows two years within which very moderate drilling requirements may be met, and provides for extensions thereafter up to a possible total of nine years, an examination of the outstanding permits, occasioned by the President's conservation order, has so far disclosed that, up to November 15, 10,995 of these permits required cancellation for lack of diligence out of approximately 20,300 outstanding. They have been largely held for speculative purposes and some have been used as a basis of blue-sky operations. The ratio of these frozen permits to the total outstanding has amounted to about 50 per cent, representing *prima facie* noncompliance with the law to that extent. No permit which has been regarded as sufficiently valuable by its holder to justify compliance with the law has been affected by this order. The total area of active permits will probably not exceed 10,000,000 acres upon which genuine development is now in progress, as against 40,000,000 acres covered by permits before this housecleaning was undertaken. The public domain is being rapidly cleared of these abuses. A method of review has been provided whereby all alleged equities under permits are considered by a departmental committee. Up to November 15, 1,512 cases had come before the committee and 1,282 of these had received favorable action. There are several thousand similar cases under review, awaiting decision. Very careful consideration will continue to be given to equities, particularly legitimate development and reliable geological investigations. That the cessation of issuance of prospecting permits has no immediate prospect of injuring the oil industry of any of the States affected is apparent when it is considered that in the seven major public land oil States of Wyoming, Utah, Idaho, Colorado, Montana, New Mexico, and California, the number of wells completed to production on public lands in all of 1928 and the first half

of 1929 amounted to 249, whereas on March 12, 1929, the date of the conservation order, there were shut-in wells in those States totaling 4,115. The great disproportion of these figures is occasioned by the situation in California where new wells on the public lands for the year and a half ending July 1, totaled 71 wells, whereas the shut-in wells on all the lands of the State on March 12 totaled 3,560. But shut-in wells outnumbered new public land wells in every one of these States except New Mexico. In the absence of a need for production from new wells, as evidenced by these figures, further exploitation of the public domain at the present time means overproduction and consequent further wastage of an irreplaceable resource.

An example of the department's policy may be found in its handling of the Kettleman Hills oil-field problem in California. That field's three domes include an area of 145 square miles, contain 49 square miles of Government-owned land. The initial production from the discovery well and an offset well indicates a tremendous potential production of very high-grade oil. Wastage of gas from the discovery well alone amounted to over 70,000,000 cubic feet per day, more than enough to supply all northern California. Drilling was proceeding on more than 20 wells prior to any adequate provision for utilization of the escaping gas and during a period when gasoline was not needed. Following some months of negotiation, the department was successful, through the efforts of Director George Otis Smith, of the Geological Survey, in concluding an agreement between its permittees indorsed by the adjoining private landowners whereby production will be restricted to a minimum in this field for two years and a well-nigh catastrophic waste of gasoline and gas avoided.

The time has come when conservation of the Nation's oil resources must be regarded as a national strategy to be settled by agreement of interests across the table top, rather than by conflict thousands of feet under the ground. Mishandling of a great exhaustible national resource will stand out more and more clearly as the supplies are diminished. The diminishing character of these supplies makes this a time of peculiar responsibility in their administration. The present conservation policy will be continued.

GENERAL LAND OFFICE

The General Land Office is the administrative agency in direct charge of the public domain, although other bureaus of the department have an active part in its administration. Under the leadership of the late Gov. William Spry, it had an energetic and efficient period of activity.

A summary of the vast volume of work handled by the General Land Office will be found in another part of this report, and comments upon its future policies are included in the discussion of the future of the public domain. The gradual taking up of the public lands of the country has caused a proportionate decline in the volume of its business but not in the character of its administration.

GEOLOGICAL SURVEY

The work of the Geological Survey illustrates another of the phases of this department related to the public domain which make the future of public lands its major responsibility. On March 21 the survey celebrated its fiftieth anniversary. The appropriations for its work have increased from \$100,000 in the year 1880 to over \$2,000,000 for the fiscal year 1930. It has before it the outstanding and highly imperative task of completion of the topographic map of the United States. Increased expenditures over a limited period will be a real saving to the United States as compared to slower progress under lesser appropriations.

The Geological Survey is a fine example of the proper place of science in Government business. The geologist with his trained mind has made a study of that part of this continent in our possession. The work of thousands of trained men, an exceptional part of them young men, has aided the mineral development of this country to an extent which has never been properly acknowledged. Membership in its staff is a badge of distinction among geologists. I expect to see its activities strengthened and its work enlarged by increased funds and increased emphasis within the department.

Its force comprises more than 500 highly trained men at work in making comprehensive surveys of our coal, oil, phosphates, potash, metalliferous ores, making topographical surveys, doing stream gaging, investigating underground water supplies, and engaging in research into many related subjects. This work is of outstanding value to the public-land States. The work of this bureau on the public

domain would not be replaceable by any State agency, and this, in connection with its large outlays, constitutes a strong reason for reservation of mineral rights from any transfer of public domain made to the States. This is true particularly in view of the fact that the Government's revenue from these minerals reverts in any event to the States, either directly or through the reclamation fund, in large part.

HYDROELECTRIC POWER

This department encounters hydroelectric-power problems in two capacities; first, in its administration of reclamation projects and Boulder Dam; and, second, by reason of the Secretary's position on the Federal Power Commission. As to the latter class, the activities of the department will be directed toward hearty cooperation with the power commission. As to the former class, a policy will be followed which will insulate the United States as completely as may be from interference with local interests and regulation. It is my belief that the proper office of the United States ends with the construction of dams and incidental structures for primarily Federal purposes only, such as navigation control, flood relief, reclamation, etc.; leaving it to municipal or private initiative to develop and market the power under lease of rights to the falling water.

That policy is being followed in working out the many problems attendant on Boulder Dam. Under the direction of the Commissioner of Reclamation, Doctor Mead, engineering plans are progressing in a satisfactory manner, with the assistance of an augmented field force. An advisory group of experts on electrical engineering and plant management is functioning and has collaborated with the bureau in determining the financial basis on which the power shall be marketed. Work on the dam will be begun as soon as adequate contracts have been negotiated and congressional appropriations made.

THE INDIAN SERVICE

Charles J. Rhoads, the new Commissioner of Indian Affairs, and William J. Scattergood, Assistant Commissioner, left large business interests to enter public service. They face a problem that has remained practically without adequate solution for the past 100 years. Under their direction a start will be made toward its solution.

The fundamental aim of the Indian Service will be to make the Indian a self-supporting and self-respecting citizen as rapidly as it can be brought about. He will be considered a potential citizen, instead of the ward of the Government. Leadership, rather than custody, is the object. Full responsibility for himself is essential to his success. Indian stock is of excellent quality and can merge with that of the Nation. To accomplish these ends it will be necessary to revise the Indian educational program along practical lines and to perfect plans for absorption of the Indian into the industrial and agricultural life of the Nation. The decentralization of the activities of the bureau will be effected as rapidly as possible. Problems of health and education should, as soon as possible, become responsibilities of the various States. Pending that change, vigorous emphasis will be placed upon these two factors in seeking Federal appropriations. The Office of Education will be asked to collaborate in supervision of Indian education and the health problem should eventually be lodged with the Public Health Service. The new policy can be characterized briefly as meaning a new deal for the young Indian and a square deal for the old Indian. It will have as its objective the placing of the Indian and his property upon a normal basis and the elimination of the Indian Bureau within a period of 25 years. In the past the tendency has been to confuse two distinct governmental responsibilities, that of wardship over the Indian's person and wardship over his property.

The white man, wanting wholesome food, a comfortable place to live in, opportunities for education and advancement, has a single way of getting them. He works for them. The Indian has often failed to satisfy those same needs because he has not learned the way to competence and happiness through work. Industrial training for young Indians and adequate mechanism for inducting them into the industrial life of the Nation is essential. It is an unsound policy to assume as in the past that their means of livelihood should necessarily be agriculture. Originally a nomadic race, the Indians, faced by pressure of white population, went to isolated places or were forced into them by military power. These once isolated areas, now surrounded by white civilization, have remained islands unmerged with the life about them. They are reminiscent of a period that is past. The Indians' original status was that of hostages and prisoners. They have remained an insoluble and

isolated element of the population. There will be many difficulties and, in some instances, it may not be desirable to bring about a complete merger between the white and Indian civilization. The Indian culture will be preserved where it has the means of subsistence and the vigor to survive, as demonstrated in some areas in the Southwest. As this modern civilization calls for a higher degree of mechanical ability, the Indian naturally skillful with his hands can find a self-supporting place. The problem of making a section of the population numbering between 350,000 and 400,000 self-supporting can be and will be solved. The problem has not been solved before largely because of the lack of resources in the attack upon it. For example, in examining the expenditures of 22 Indian schools for the fiscal year 1929, it was found that the average expenditure for clothing per year per pupil was \$22.26, against a minimum requirement of at least \$50. As to diet, the average per pupil per day, even under the last allowances available, was considerably below the 37.8 cents found to be the minimum requirement by a carefully selected committee of physicians and specialists. The actual figures for food per pupil per day in these 22 schools was 20 cents, of which 14 cents represented food purchased and 6 cents represented food produced. Examination of these figures should indicate one reason why the health of the Indian population is not up to white standards.

BOARD OF INDIAN COMMISSIONERS

The Board of Indian Commissioners is an independent organization dissociated from the Indian Service and acting in an advisory capacity to the President and the Secretary. Its work has been valuable and enlightening. A summary of its current activities will be found in another part of this report. Attention is particularly called to its full report published separately which contains a valuable review of the entire period of Indian administration.

OFFICE OF EDUCATION

The plan of reorganization of the Office of Education has been completed and is in process of execution. Its principle is the establishment of the Office of Education as a research organization rather than an administrative agency. It will transfer to other agencies its present administrative activities so far as possible and concentrate on fact finding and research in the many fields of education. In the

past it has been the administrator of the educational system of Alaska. As rapidly as may be that responsibility should be transferred to other agencies more local to Alaska. It has, through an anomalous development, become the custodian of the Alaskan reindeer through its efforts to assist the Alaskan natives to become self-supporting. Care of the reindeer will be transferred to more appropriate channels. The energies of the office will thus be devoted to its proper functions of investigation and publication of data designed to be of assistance to local authorities in proving school standards. It will have an administrative division, under a chief clerk; a division of educational research and investigation, under an assistant commissioner; a division of publications, under an editor in chief; a library division, under a librarian; an educational service division, under a service chief; and a division of major educational service, under the commissioner himself. Known in the past as a bureau, its present dissociation from administrative burdens will be marked by a change of name. Hereafter it will be known as the Office of Education.

The work of the advisory committee on education is one of the most important with which the Office of Education is currently associated. This advisory committee is made up of a number of the most prominent educators of the United States. Its work will be to make an exhaustive and authoritative study of the activities of the Federal Government in the field of education. It is made up of men of experience and individuality, and nearly every school of thought regarding this problem is represented. Its work should be of the greatest importance in shaping the future trend of the Office of Education and in forming a basis for recommendations to Congress. The cooperation of those invited to serve on this committee has been gratifying.

Independently, a nation-wide survey of secondary education is now in progress under a three-year appropriation program. The results of this survey will be of great value in presenting to the country the facts of this phase of education.

Local government in education is, in my opinion, the keystone of proper training for citizenship by universal public education. A unique distribution of the taxing power, so that the majority of the taxes have been raised and spent in the local districts and States

and only a modest percentage outside of those for war and its after effects has come from the Washington Government, has permitted a wide range of development in the public schools. There have, fortunately, been no national universities. State universities developed after a prolonged period of privately operated and later privately endowed institutions of higher learning. These private institutions have provided a constant stimulation for State institutions of equal rank. The hand of centralized government has been largely kept off the school-teacher and the schoolroom. In some areas absence of a proper sense of self-government, financial disability, and a lack of organizing power have provided some dark spots. A suggestion has been frequently made that a national mechanism should be set up to bring these dark spots up to the average level of the country. Correction of abuses is a poor method of administration. There is a distinct menace in the centralization in the National Government of any large educational scheme. Abnormal power to standardize and crystallize education which would accompany financial power would be more damaging to local aspiration and local self-respect and to State government and State self-respect than any assistance that might come from the funds. We can not rise higher than our source. That source in government with us is local. There is a distinct place for research and the dissemination of information in the administrative side of education in the National Government but it should not be recognized as an administrative position with large funds at its disposal. A department of education similar to the other departments of the Government is not required. An adequate position for education within a department and with sufficient financial support for its research, survey, and other work, is all that is needed. That is the aim of the newly reorganized Office of Education and that will be its position in this department.

The office will give increasing attention to the possibilities of the use of radio in education. To that end a series of conferences have been organized and are proving of value. The radio constitutes an entirely new force, giving practically continent-wide range to the voice and the musical instrument and, hence, to lectures and features not otherwise available to rural classrooms. It seems inevitable that great use must be found for the radio in our public

educational system. It will render it possible to choose the most expert lecturers and to have their audiences in many places—homes and classrooms instead of one hall. It has been used until recently largely for entertainment and amusement, but is passing out of that stage into that of community and domestic utility. Its possibilities in the field of education will be closely followed by the Office of Education and its use furthered through consideration by the Radio Education Conference.

PENSIONS

The Pension Bureau, under the direction of Col. Earl D. Church, will be based as far as possible on sound insurance principles. A high grade of medical service is demanded. Many important individual decisions involving substantial amounts of money must be made and they should be based largely upon the physical findings of the medical staff. The large problem of handling the pension affairs of those having proper places on the rolls through their declining years needs to be carried out with sympathy and efficiency, both from a human and a financial standpoint. The aims of the Pension Office will be honesty, fairness, justice, and promptness. It is particularly important to eliminate all elements of fraud. Help will be given to those who have rendered the requisite service to their country, but there is every reason for not bringing in among those so honored and helped any who are not deserving. A sound economical basis which will operate with justice to all concerned will be the aim of Colonel Church and his associates. Experience in the insurance field will be a splendid starting point for maturing plans to that end, and for administration of the civil service retirement laws, for which the bureau is responsible. Plans are also in process of formulation for practical coordination in the field between the efforts of the Pension Bureau, the Veterans' Bureau, and the National Soldiers' Home, looking to an elimination of overlaps and duplications in administrative work. The magnitude of the bureau's work may be judged from its disbursements for the past year totaling \$229,889,986.48. The basis for disbursement is largely statutory, but as these statutes are founded in a large part on recommendations of the bureau the importance of sound plans for the future as a basis for recommendations to Congress is apparent.

THE NATIONAL PARKS

In dealing with national parks, the efforts of the department will be concentrated on three principal efforts: First, the high standards for scenic and recreational values established by the present parks must be met by any new park projects; second, rounding out the national park system by bringing some new carefully selected parks into the system, by bringing under its jurisdiction the national military parks, and by adding desirable areas to existing parks; third, the consolidation of park areas by elimination of private holdings within their boundaries. In visiting the parks I have found the personnel of this young and vigorous bureau one of the most valuable contact groups between the Federal Government and the people. It has taken its place as a major bureau and should be classified as such.

The road and trail program is being energetically carried out. Five million dollars a year for this purpose is the present appropriation. A 10-year program has been drawn up and is being followed. It contemplates reconstruction of existing roads on modern standards and the construction of certain new roads and improvement and extension of the trail system. Large areas in the parks are to be left in their natural wilderness state, accessible only by trail on foot or horseback. An excellent example is Glacier National Park. I have seen no reason to modify this plan in order to open new country in the older and highly developed parks like Yellowstone and Yosemite. Preservation of primitive landscape conditions, adequate protection of wild life, and the safeguarding of forests and watersheds can not be carried out if a reasonable balance between accessibility and wilderness value is not maintained. A group of landscape architects pass on all plans for improvements in the park system and roads and trails are built according to designs that will give the least injury to natural features. The public-utility operators are cooperating in this field.

The Park Service faces splendid opportunities in new fields of public education as well as along its present lines. It now serves 3,000,000 people annually. I have asked that a careful survey be made of the rates and returns of the various utilities operating in the parks to the end that a fair balance between service and profit may continue to be struck.

SOLICITOR'S OFFICE

No legal organization with which I have had contact can exhibit a more impressive record of business done than the office of the solicitor of this department. During the past year 36,172 matters were handled and only 975 remained unfinished at the close of the year. A table appears in another part of this report indicating the character of work handled.

THE TERRITORIES

Summaries of the reports of the Governor of Alaska and the Governor of Hawaii will be found in a later part of this report.

In Alaska the problem is one of proper correlation between the work of the Territory and that of the Federal Government. An endeavor will be made to simplify the Department of the Interior's part in Federal administration by transfer of some of its activities under the act of February 20, 1927 (44 Stat. 1068), to the Alaska Board of Commissioners, which consists of the governor, representing the Department of the Interior, a representative of the Department of Commerce, and a representative of the Agriculture Department. Such transferred activities will include supervision of the reindeer herds. The Office of Education's district supervisor is being transferred to Alaska from Seattle and will be responsible to this commission instead of to the Office of Education.

In the past the Office of Education has administered the affairs of the Metlakatla colony on Annette Island. An endeavor will be made to work out a proper system of cooperation between the office, the Territory, and local organizations in freeing the office of this administrative burden.

One of the problems of Alaskan administration has been the Alaska Railroad, with its large annual deficit. An effort will be made to aid in the establishment of industries whose traffic may benefit this road, particularly by exploitation of great possibilities offered by Alaska's reindeer herds as a meat supply and by development of the Territory's coal fields.

Hawaii's Territorial organization is such that its administrative contacts with the department, aside from financial supervision, are comparatively few. The department can be of assistance in the

cooperation of its bureaus with the Territorial government and in closer contact to that end. Among the department's bureaus active in Hawaii are the National Park Service, which administers the Hawaii National Park, and the Geological Survey, which conducts volcanologic and seismologic observations at Mauna Loa and Kilauea.

ELEEMOSYNARY INSTITUTIONS

This department administers 3 eleemosynary institutions in the city of Washington: Freedmen's Hospital, whose work is primarily devoted to colored patients; St. Elizabeths Hospital, handling mental cases; Howard University, a college for negroes; and in a measure looks after the Columbia Institution for the Deaf, an independent institution. Summaries of the work of these institutions appear separately in this report. Their work is larger than is generally recognized. St. Elizabeths cared for 4,899 patients during the year. The Columbia Institution for the Deaf cared for 129 men and women, and Howard University for 2,671 negro students. Freedmen's Hospital gave care to 4,033 indoor patients. Endeavor will be made to more closely correlate the work of these institutions with that of the department and to afford them such assistance as may be available by the department's bureaus.

COLLATERAL ACTIVITIES

Attention is directed in another part of this report to the work of the departmental archæologist, the General Education Board, the Fuel Administration records, and the Perry's Victory Memorial Commission. These are independent activities reporting formally to the Secretary of the Interior.

PART II: THE YEAR'S WORK IN BRIEF

Reports of the Territories and of each of the bureaus and independent organizations are published separately, and for full information their reports may be referred to. Their work is summarized briefly below:

OFFICE OF THE SOLICITOR

The following is a statement of the matters received and disposed of in the Office of the Solicitor during the fiscal year ended June 30, 1929:

	Public-land matters		Pension matters		Retirement matters		Miscellaneous matters
	Appeals	Motions	Appeals	Motions	Appeals	Motions	
Pending July 1, 1928.....	586	15	121	1	7	1	60
Received during the year.....	1,886	127	841	37	65	13	33,387
Total.....	2,472	142	962	38	72	14	33,447
Disposed of during year.....	1,742	119	797	35	62	13	33,404
Pending June 30, 1929.....	730	23	165	3	10	1	43

“Miscellaneous matters” includes the following:

Formal opinions of the solicitor.....	90
Correspondence relative to proposed legislation.....	525
Matters arising in the Office of Indian Affairs.....	17,012
Contracts.....	1,119
Requests for instructions on questions of law, proposed circulars, preparation of suits for the Department of Justice, etc.....	516
Preparation of letters for the Secretary and Assistant Secretaries involving questions of law.....	701
Cases submitted to the board of equitable adjudication.....	1,623
Applications for repayment.....	210
Applications for permits to prospect for oil, gas, and coal.....	2,539
Applications for leases (oil, gas, coal, potash, etc.).....	101
Assignments of leases and permits.....	199
Cancellation of prospecting permits.....	8,756
Applications for coal licenses.....	13
Total.....	33,404

The foregoing does not include a large number of miscellaneous matters of which no formal record is kept, nor does it show the numerous hearings, oral consideration, and personal interviews relating to important business which came before the office.

The following shows the number of cases on hand July 1, 1929, compared with the number on hand July 1, 1928:

	1929	1928
Public land matters:		
On appeal.....	730	586
On rehearing.....	23	15
Pension matters:		
On appeal.....	165	121
On rehearing.....	3	1
Retirement matters:		
On appeal.....	10	7
On rehearing.....	1	1
Miscellaneous matters.....	43	60

During the year 21 suits in which the department was involved, and which are being defended by this office, were instituted in the Supreme Court of the District of Columbia. A number of the suits grew out of the passage by Congress of the act approved February 13, 1929 (45 Stat. 1166), providing for a review by the courts of questions of law involved in the denial by the Secretary of the Interior of claims for losses filed under the war minerals relief act of March 2, 1919 (40 Stat. 1274), and its amendments. It is expected that more than 300 cases will be filed during the limit of one year fixed by the act.

Suits have been filed to test the authority of the Secretary of the Interior exercised by him in connection with the policy of the President to conserve Government-owned oil and gas deposits.

On June 30, 1928, the number of cases pending in the Supreme Court of the District of Columbia in which the department was involved was 15. As heretofore stated 21 new suits were filed during the last fiscal year. Of the 36 cases thus pending 6 were disposed of, leaving 30 pending.

In the Court of Appeals of the District of Columbia six cases were pending at the beginning of the year. During the year 4 appeals were filed and 5 disposed of, leaving 5 appeals pending.

Two petitions for writs of certiorari on behalf of the department were filed in the Supreme Court of the United States, both of which

were granted and are now pending in that court. One of them, known as the Krushnic case, involves the construction of the law upon which depends the disposition of a large area of oil-shale lands. The right of the applicants to acquire such lands was denied by the department, which prevailed in the Supreme Court of the District of Columbia, but its decision was reversed by the Court of Appeals. The other case involves the right of many claimants to participate in the distribution of the annual income accruing to a fund belonging to the Chippewa Indians of Minnesota. A third petition for certiorari opposed by the department was denied.

GENERAL LAND OFFICE

Receipts and expenditures.—The total cash receipts from sales, leases, and other disposition of public lands (including receipts from copies of records, sales of Government property, etc.) were \$5,654,435, and from sales and leases of Indian lands, \$539,531.33, an aggregate of \$6,193,966.33, all of which was deposited in the Treasury.

Five per cent of the net proceeds from cash sales of public lands is paid to the public-land States within which such sales were made, and the balance of such net receipts from States named in the reclamation act, together with the net receipts from fees and commissions from these States, is credited to the reclamation fund; 90 per cent of the receipts under the mineral leasing act (exclusive of receipts from lands within naval petroleum reserves) is divided between the States from which the minerals (principally oil) were taken and the reclamation fund (37½ per cent to the States and 52½ per cent to the reclamation fund); the receipts from sales of reclamation town sites and camp sites and rentals and royalties from potash leases are credited to the reclamation fund; approximately 85 per cent of receipts from sales of land and timber in the forfeited Oregon and California railroad grant is paid to certain counties in Oregon in lieu of taxes that would be collected by the counties if the lands were in private ownership; 25 per cent of the receipts from sale of land and timber in the Coos Bay wagon-road grant is paid to the counties within which the sales were made; the receipts from Indian lands, with the exception of 37½ per cent of rentals and royalties from the Red River oil lands in Oklahoma, which is paid to the State, are deposited in the Treasury to the credit of the various Indian tribes. All other moneys are deposited in the Treasury to the credit of the general fund.

The following table shows the disposition of these moneys in so far as it is possible to do so before final settlement of all accounts by the General Accounting Office.

Source of receipts	Disposition in the Treasury			
	General fund	Reclamation fund	State funds	Total
Sales of public lands.....	\$46,304.12	\$255,598.08	\$10,242.25	\$312,144.45
Fees and commissions.....	96,856.69	365,094.11	-----	461,950.80
Bonuses, rentals, and royalties from mineral leases.....	431,054.94	2,038,805.94	1,456,289.95	3,926,150.83
Sales of land and timber in Oregon and California railroad grant.....	104,018.88	-----	1 580,000.00	684,018.88
Sales of land and timber in Coos Bay wagon-road grant.....	131,151.16	-----	2 43,717.05	174,868.21
Sales of reclamation town sites and camp sites.....	-----	8,152.44	-----	8,152.44
Sales of timber in Alaska.....	7,464.28	-----	-----	7,464.28
Royalties on coal leases in Alaska.....	6,661.80	-----	-----	6,661.80
Rentals from fur farms in Alaska.....	1,280.00	-----	-----	1,280.00
Royalties and rentals from potash deposits.....	-----	11,448.75	-----	11,448.75
Power permits.....	12,302.16	-----	-----	12,302.16
Miscellaneous (copies of records, survey fees, sales of Government property, etc.).....	47,992.40	-----	-----	47,992.40
Total.....	885,086.43	2,679,099.32	2,090,249.25	5,654,435.00
Sales and leases of Indian lands.....	-----	-----	-----	3 539,531.33
Aggregate.....	-----	-----	-----	6,193,966.33

¹ Estimated amount to be paid certain counties in the State of Oregon in lieu of taxes.

² Amount payable to Coos County as 25 per cent of proceeds of sales of lands and timber.

³ Of the amount received as royalty from oil lands in the bed of the Red River, Okla., 37½ per cent, amounting to \$41,784.58, is paid to the State of Oklahoma, and the balance, amounting to \$69,640.98, is credited to the Kiowa, Comanche, and Apache Indians.

The total expenditures for the conduct of the business of the General Land Office and its field activities amounted to \$2,237,303.38. Disbursements from deposits by individuals for surveying public lands (\$25,560.52) and from appropriations and funds for surveying Indian reservations (\$86,541) are not included in the above figures, either as receipts or expenditures.

Area of land entered and patented.—The total area of public and Indian lands embraced in original entries allowed during the year was 4,612,722 acres, as compared with 3,726,421 acres the previous year.

The area patented was 2,494,647 acres, as compared with 2,477,868 acres the previous year. Of the above area 1,890,026 acres were patented under the homestead laws.

Field service.—The total amount of cash collected and turned into the Treasury as the result of the work of the field service was \$37,345.74. Civil suits brought through the Department of Justice and criminal prosecutions instituted upon the recommendation of the public land service resulted in the recovery of \$5,870, the restoration to the public domain of 6,237 acres, \$2,180 in fines collected, 8 convictions, and 6 prison sentences. Twenty-nine indictments were secured.

Due to the activity of the field investigators, 159,000 acres were restored to the public domain, representing attempts to secure through fraud title to Government land. The field examiners investigated and reported upon 15,948 cases, of which 5,474 were adverse to the claimants and 10,474 were favorable reports.

Forest fires.—The appropriation for protecting public land, timber, etc., under which the field investigating service is maintained, contained a legislative allotment of \$40,000 for the prevention and suppression of forest and other fires on public lands. A total of \$40,644.96 was expended or obligated during the fire-hazard season, or \$644.96 more than the allotment. This excess was paid from the funds provided for the routine work of the service. At the beginning of this fiscal year, or from July 1 to September 30, 1928, there were employed 47 forest patrols and lookouts. At the opening of the fire-hazard season in 1929, or during the months of May and June, 1929, 58 patrols and lookouts were on duty, as follows: Alaska, 3; California, 14; Idaho, 16; Montana, 3; Oregon, 12; Washington, 10.

The fire hazard in the northwestern and Pacific Coast States is extreme. While this department has done fairly well in its attempts to protect Government timber from the ravages of fire, it has not met its share of the expense when the sums expended by the individual States and private interests are considered. The Government should not depend on the States to protect the public timber and brush lands. It should heartily join with them in their efforts to protect and conserve the timber resources of the West and Northwest.

It is therefore urged that, without reducing the amounts for other protection purposes, the allotment for fire protection be increased \$60,000, or to a total of \$100,000, instead of \$40,000, the present allotment.

Surveys.—The public land survey was extended during the fiscal year in 25 States and in the Territory of Alaska under 243 separate groups, 91 of which, in 20 States, were resurveys. In addition, miscellaneous surveys, including work for and in cooperation with other Federal agencies, were executed in every part of the public domain. The largest volume of surveys executed during the year in any one classification were those initiated upon applications for surveys to meet the requirements of entry under the enlarged and the stock raising homestead acts and by the States. Activities in this field, aggregating over 3,000,000 acres in surveyed and resurveyed lands, were carried on in all Western States, the more extensive areas surveyed being in Arizona, California, Idaho, Montana, New Mexico, and Utah. In the mineral classification there were surveyed 200,000 acres of land deemed to be valuable for oil and 95,000 acres of potash lands in Utah and 46,000 acres of oil-shale land in western Colorado. In addition there were surveys of mineral lands in western Wyoming and in Nevada and New Mexico. Cooperative surveys were executed for the Forest Service, National Parks Service, Federal Power Commission, the Department of Commerce, and for the Supreme Court of the United States.

Surveys on Indian lands were executed during the year under various appropriations therefor. During the year that part of the resurvey work which may be measured on an area basis aggregated over 1,000,000 acres. There were accepted and placed on file plats representing 2,593,034 acres of original surveys of public lands and in addition 788,653 acres of lands resurveyed, comprising an aggregate area of 3,381,687 acres.

Map making and drafting.—The copper-plate base of the United States map was revised for printing the 1929 edition. State maps of Minnesota and the northern half of California were revised, printed, and issued. A map of the southern half of California was compiled and is now in the hands of the contractor for printing. The map of Nevada has been recompiled and the drafting thereof is now approaching completion. Special maps were also prepared for the Department of Justice in connection with suits brought by Indians to recover the value of large areas of land within nine different States. There were sold 20,490 photolithographic copies of township plats, for which \$10,363.25 was received, and 7,638 copies were furnished other departments for official use.

Homestead and related entries.—There were approved for patent 8,236 homestead entries.

In those public-land States where the last remaining district land offices have been discontinued the work formerly performed by those offices has been transferred to this office, thereby materially increasing the duties of the office. The business is transacted directly with the public. Diagrams and plats showing status of lands are made and furnished, claimants are advised regarding status of particular tracts of lands, and necessary procedure to be followed for the proper initiation and perfection of claims, also as to the method of initiating and prosecuting contest proceedings. All necessary blank forms are provided. Correspondence work has likewise been materially increased. Land matters are handled from the very inception of an application to its conclusion.

Stock-raising homesteads.—Final stock-raising homestead entries numbering 3,271 for 1,350,384.64 acres were patented with a reservation of all minerals to the United States. Since the passage of the stock-raising homestead act 55,079 patents thereunder have been issued, covering an aggregate of 20,232,398 acres.

Stock driveways.—The area withdrawn during the year for this purpose amounted to 92,287 acres and that released from such withdrawals to 17,765. The total gross area included in stock-driveway withdrawals at the close of the fiscal year was 9,282,975 acres.

Mineral entries.—During the year 276 entries under the mining laws were approved for patent and 1,164 mineral entries were received for action.

Oil and gas applications.—Under sections 13 and 20 of the leasing act 3,222 applications for permits were received. Permits were granted on 2,488 applications. There were received for reconsideration 51,220 cases; 16,562 permits were held for cancellation and 8,906 permits were canceled, and 11,937 cases were examined on which further action was necessary. Since the inauguration of the oil-conservation policy on March 12, 1929, no new applications for prospecting permits have been received. Applications pending at that time were finally rejected and closed, and all permits not in good standing were held for cancellation and upon failure to show cause were canceled. Those cases in which equities were alleged by permittees and showings in support thereof filed are receiving careful consideration, and this work is being disposed of as rapidly as possible.

Under section 14 of the leasing act, which authorizes leases to permittees who show a discovery of oil or gas as a result of prospecting under a permit, 50 leases were issued covering an aggregate of 24,069 acres. Under section 17, authorizing the public sale of leases, three leases were issued in the Monroe gas field, Louisiana, aggregating 359 acres, on which bonuses were paid amounting to \$6,687.50. During the year 619 applications for relief under sections 14, 18, 18a, 19, and 22 of the act were considered and 53 leases were granted.

Other mineral permits and leases.—During the year 83 coal prospecting permits were issued, covering 91,090 acres, and 39 coal leases, covering an aggregate of 6,511 acres, and 13 coal licenses, covering 426 acres, were issued. Thirty-two potash permits were issued under the act of October 2, 1917, covering an aggregate of 63,905 acres, and under the act of February 25, 1920, eight sodium permits were issued.

Receipts under the mineral leasing act.—Receipts from bonuses, royalties, and rentals under the law providing for the leasing of mineral rights on the public domain aggregated \$3,884,878.68. The largest receipts were obtained from leasing mineral lands in Wyoming, the amount being \$2,835,871.32. The second State in the amount of receipts was California, with \$644,191.22. Pursuant to the mineral leasing act, each State receives 37½ per cent of the receipts from bonuses, rentals, and royalties derived from the public lands within its borders, the reclamation fund receives 52½ per cent, and the other 10 per cent remains in the Treasury of the United States and is credited to miscellaneous receipts.

Restorations and openings subject to preference right of ex-service men.—During the year the public lands in areas restored to entry and opened on survey with a preference right to veterans of the World War amounted to 237,891 acres and 1,547,144 acres, respectively.

Aviation leases.—Under specific authority of Congress, 320 acres were leased to the town of Parco, Wyo., for a period of 20 years as an aviation field. Under the general law providing for aviation leases, 16 applications were filed and further action awaits compliance with the regulations by the applicants or reports from the Department of Commerce.

Fur farming.—Consideration was given to 160 applications for leases for fur farming in Alaska; 10 leases were granted, 2 were canceled, and the remainder of the applications await reports from the field.

Grazing leases in Alaska.—Seventy-nine applications for grazing leases were filed, but action in the majority of the cases awaits reports from the field.

State, county, or city recreational areas.—Twelve withdrawals were made for recreational classification aggregating 69,089 acres, based on 1 municipal, 4 county, and 7 State petitions. Two tracts have been purchased under the law by the State of Oregon. Four withdrawn areas have been released, having been found not chiefly valuable for recreational purposes.

National forests.—There are now 150 national forests embracing 184,564,953 acres, of which a little over 86 per cent is public land. Changes made effected a gross addition of 1,121,258 acres to national forests and the exclusion of 960,124 acres therefrom.

Railroad rights of way.—Two hundred and seven railroad right-of-way applications were received. Forty-three were approved, 2 canceled, and requirements made in 123 cases.

Stock water reservoirs.—Eighty-five reservoir declaratory statement applications were received. Requirements were made in 15 cases, and 66 were otherwise disposed of.

All other rights of way.—Five hundred and sixty-three irrigation and miscellaneous right-of-way applications were received, which, together with 65 brought over from the previous year, made a total of 628. Under action taken 20 cases remained on hand at the close of the year.

Forfeitures.—The number of approved rights of way of all kinds which were awaiting office action July 1, 1928, was 51, which, together with 1,017 received, totaled 1,068. Of these, proof of construction was accepted on 95, there were canceled by relinquishment or default 146, requirements were made in 721 cases, and 75 were otherwise disposed of. Five forfeiture suits were recommended and 23 decrees of forfeiture obtained as a result of previous recommendations. Thirty-one suits are pending in the Department of Justice.

Hydroelectric power.—Seventy-one hydroelectric power project applications were transmitted to the General Land Office by the

Federal Water Power Commission, involving public lands and lands within national forests in 11 States and the Territory of Alaska.

United States reclamation projects.—Original homestead entries on reclamation projects pending at the beginning of the fiscal year were 138, and there were 427 received. One hundred and seventy-three were examined and accepted, 41 canceled, and claimants were called upon for additional evidence in 79 cases. One hundred and eighty-seven reclamation homestead entries were approved for patent.

Reclamation withdrawals and restorations.—During the year there were promulgated 15 orders of withdrawal and 46 orders of restoration under the reclamation act. The outstanding item was the withdrawal for the Colorado River storage, or the Boulder Dam project, of 2,746,360 acres in Arizona, 237,440 acres in California, and 105,680 acres in Nevada.

State irrigation districts.—Since the passage of the acts of August 11, 1916, and May 15, 1922, applications by 72 irrigation districts for approval have reached the office. During the year 5 applications were approved, 2 rejected, and 1 is awaiting further evidence on behalf of the districts. Since the date of the acts applications by 58 districts, embracing a gross area of 2,432,258 acres, have been approved; and applications by 14 districts, embracing a gross area of 274,688 acres, have been finally rejected. Interlocutory action on all districts during the year involved a total of 402,914 acres.

Private irrigation projects.—During the past fiscal year 13 reports were received as the result of investigations of private irrigation enterprises and State irrigation districts upon which claimants and applicants under the desert-land law were depending for their water supply, making a total of 1,401 such projects reported on since the adoption of the regulations of September 30, 1910.

Desert lands.—The disposals are summarized as follows: Desert-land entries approved, 529; canceled, 501; requirements made, 1,446; otherwise disposed of, 739; pending at close of the year, 212.

Carey Act.—Carey Act withdrawals, segregations, and patent applications aggregating 1,379,871 acres were considered and either interlocutory or final action was taken upon 1,373,296 acres thereof. The total area now segregated and unpatented is 733,806 acres.

Pittman Act.—Three hundred and forty-nine Pittman Act applications and permits were before the office for action; 80 were approved, 89 canceled, requirements were made in 100 cases, and 17 were otherwise disposed of.

Swamp lands.—During the past year there were patented under the swamp land act 11,033 acres to the several States entitled thereto.

Withdrawals and restorations.—During the year 6,022,954 acres of public land were withdrawn or placed in a state of reservation by either Executive or departmental order, and 716,337 acres theretofore withdrawn or reserved were restored to entry or other proper disposition.

Contests.—Two thousand five hundred and eighty-nine contest records were received and decisions were rendered in 2,517 cases.

Indians and Indian lands.—Fee patents to the number of 1,208, involving 177,643 acres, and 887 trust patents for 95,804 acres were issued. A very considerable amount of data was furnished to the Court of Claims in connection with suits brought by various Indian tribes.

State grants and State selections.—Title was conveyed to various States covering 169,927 acres involved in indemnity school selections and 2,914 acres of quantity selections. Conveyances amounting to 6,690 acres were made to the States with a reservation of certain mineral deposits. The act of January 25, 1927, granting mineralized school sections to the various States, greatly increased the work of adjudication of indemnity school-land selections, as it was necessary to determine whether title passed to the State under the original granting act as nonmineral land or under the act of 1927 as mineral land, and whether the State is entitled to indemnity on account of the mineral character of the land or for other reasons.

School sections.—Three hundred and seventy-four adjudications of school sections were made and it was held that title remained in the United States as to 13,251 acres, that 124,416 acres had passed to the States under the original grant, 40,608 acres under the act of January 25, 1927, and that 14,079 acres had passed to the States in cases where the General Land Office declined to specify the act under which title had passed.

Railroad grants and selections.—Railroad and wagon-road selections were received during the year to the amount of 161,493 acres, and during the same period there were certified and patented in satisfaction of such grants 230,418 acres, the total acreage adjudicated being 367,827 acres.

Railroad adjustments.—The work of adjusting nine railroad land grants was completed. The act of June 25, 1929, directed the institution and prosecution of proceedings looking to the final adjustment of the Northern Pacific Railroad grant.

Oregon and California railroad lands.—Under the act of June 9, 1916, 101 sales of timber were held during the year involving 9,946 acres, containing 252,552,000 feet board measure of timber, for which \$571,411.15 was received.

Town sites.—During the year 2,181 town-lot cases were examined and 374 patents were issued for lots.

Government title to Harding town site sustained.—In the suit brought by the United States to eject Lewis G. Norton from land occupied in the town site of Harding, Fla., which had been pending for several years, involving about \$400,000, final judgment was returned in favor of the Government by the Federal District Court of Florida.

Abandoned military reservations.—One hundred and fifty-nine cases involving abandoned military reservations were considered and 40 patents were issued.

Exchanges.—Ninety-two applications for exchanges under the act of January 27, 1922, were considered and patents were issued in 34 instances.

Forest consolidations.—Under the acts of March 20, 1922, and February 28, 1925, authorizing the Secretary of the Interior to accept title to any privately owned lands within the exterior limits of national forests which, in the opinion of the Secretary of Agriculture, are chiefly valuable for national-forest purposes, and in exchange therefor to patent other lands in the same State, 726 cases were adjudicated, resulting in the issuance of patent in 65 cases and in adding 198,832 acres to the national forests.

Forest lieu selections.—Four hundred and sixty-one forest lieu selections were considered and 34 cases were approved for patenting, many of them being selections which had been awaiting final adjudication pending the survey of the selected land.

Riparian rights.—Forty-nine cases involving riparian rights were considered and patents were issued in 34 instances.

Scrip, warrants, etc.—One hundred and forty-three scrip cases were considered and 10 patents issued. Nine hundred and thirty-six cases involving soldiers' additional homestead rights, commonly called soldiers' additional scrip, were considered and 59 patents were issued. While there is not a large number of military bounty land warrants now outstanding, and these must be used in lieu of cash as payments on other entries or claims, there is much correspondence regarding matters of a historical nature in connection with these warrants.

Repayments.—Under the several acts governing repayments, there were stated during the fiscal year 210 accounts allowing repayment of \$20,101.27, and during said period there were denied 158 claims for repayment.

Tract book notations.—The total number of notations for the year was 190,680. This includes 76,939 appeals and other miscellaneous cases, 774 Indian allotments, 8,224 final and cash certificates, 4,459 oil and gas applications, 233 coal applications, 13,230 original entries, and 479 plats of survey.

District of Columbia.—Patent for approximately 4 acres of land in Randle Highlands in the District of Columbia was issued to Byron E. Hamlin under resolution of Congress approved February 16, 1839 (5 Stat. 365).

Remaining public domain.—Exclusive of Alaska and the public lands included in Indian reservations, national forests, and national parks, and withdrawn for water power, stock driveway, and other public purposes, or withdrawn as valuable for mineral or for prospective mineral value or classified as mineral, the area of the public domain subject to disposition under applicable land laws on June 30, 1929, was 190,031,722 acres, of which 137,194,449 acres are surveyed, the remainder being unsurveyed.

OFFICE OF INDIAN AFFAIRS

This summary covers a period antedating in its entirety the administration of the present commissioner and assistant commissioner, who took office July 1, 1929.

In presenting a résumé of the activities of the Indian Service during the fiscal year attention is again invited to the inadequacy of the yearly appropriations for accomplishment of its work and to the wisdom of increased appropriations as an economic measure.

For teaching positions in the Indian school service the required civil service qualifications have been raised and for positions of principal a degree has been made a prerequisite for examination and appointment. Indians have been given a classified civil-service status effective April 1, 1929, but after that date those entering the service, except in certain minor positions, are required to qualify in open competitive examination, certain preferences being allowed, however, in compliance with existing law requiring that Indians shall be employed whenever practicable.

In the health work closer cooperation has been developed with State, county, and municipal health organizations, whereby diagnostic, laboratory, and clinical facilities of these various organizations are being made known and available to health agencies of the Indian Service. Through the activities of the service some decrease in the incidence of trachoma has been indicated and facilities for treatment of this disease have been increased. Several new hospitals and sanatoria were established during the year. Preparations were made to operate the Tacoma Hospital, Washington, with a capacity of about 100 beds for treatment of tuberculosis. Other hospitals were established at the Western Navajo jurisdiction, Chin Lee and Havasupai, all in Arizona; at Taos and Tohatchi, N. Mex., and at Keshena, Wis. A converted building has been made into an improvised sanatorium at Crow Creek, S. Dak., and a new sanatorium has been built within the Yakima Reservation at Toppenish, Wash. These hospital and sanatorium facilities have added approximately 312 beds for Indians in need of treatment.

In continuance of the effort to further the enrollment of Indian children in the State public schools, now having an attendance of about 35,000, a movement has been inaugurated to study the enrollment in the Government boarding schools in order to eliminate therefrom those who may to advantage attend the public schools and thus make room for many other Indian children who are without educational opportunities.

Age-grade comparisons are given for the fiscal years 1926 to 1929, inclusive, and these show a consistent increase in the number of Indian children in the higher grades, especially from the seventh to the twelfth, inclusive.

For many years existing law has limited the expenditure for support of Indian boarding schools to certain fixed but inadequate amounts per pupil. For many years the limit so prescribed was \$167 per capita, but was later raised somewhat, the highest allowance being \$285 for schools having an attendance of less than 200 students. This legislation has been repealed by act of March 2, 1929.

Generally throughout the country the Indians have continued to make encouraging progress along industrial lines, especially in farming and livestock activities, and preliminary reports indicated that there was a substantial increase in the number of Indians farming and in the cultivated acreage on nearly all of the reservations. Cooperation in this work has been given by the extension service of the United States Department of Agriculture and by many State colleges which have placed their facilities at the disposal of the Indian Service. There were appointed during the year six directors of agriculture and three home demonstration agents, and this personnel should do much in furtherance of the agricultural pursuits. It has been reported that there are many first-class farmers among the Indians of the Five Civilized Tribes, and that commendable progress has been made in the education and competency of the restricted Indians. It is said that in many instances the Indian farmers have benefited by the demonstration and results of superior methods employed by white farmers in their neighborhood and desire better homes and more modern farming equipment.

The Coolidge Dam for conservation of the waters of the Gila River in Arizona has been completed. This will serve to irrigate approximately 100,000 acres, of which 50,000 are allotted lands within the Pima Reservation, where opportunity will be thus afforded to these Indians for their agricultural development.

The act of May 18, 1928 (45 Stat. L. 602), authorized the attorney general of the State of California to bring suit in the United States Court of Claims on behalf of the Indians of the State and directs the Secretary of the Interior to make a roll of those Indians who shall be found entitled to share in any favorable judgment.

There are 205 Indian irrigation projects, of which 80 were active during the year. The cost of these to June 30, 1929, has approximated, for construction, \$37,104,000, and for operation and maintenance, \$10,284,000. The total area of land under constructed irrigation works is 754,000 acres, the total acreage irrigated during 1928 being 387,552 acres. Of this quantity the acreage irrigated by

Indians was 124,316, the area irrigated by lessees 103,578, and by white owners of land 159,658 acres.

BOARD OF INDIAN COMMISSIONERS

In April, 1929, the Board of Indian Commissioners passed its sixtieth year of active cooperation, as one of the independent Government establishments, with the President, Congress, the Department of the Interior, and the Bureau of Indian Affairs, in matters concerning the Indians who are under Federal administration. Its value lies in its independence of viewpoint.

During these six decades the board not only has transmitted reports on its field investigation and problem surveys to the Secretary but also has submitted to him an annual report. Its sixtieth annual report shows that during the fiscal year 1929, the board officially visited and inspected 23 Indian Service agencies and nonreservation schools in California, Florida, Michigan, Minnesota, Montana, Nevada, New Mexico, New York, North Dakota, Oregon, South Dakota, Washington, and Wisconsin.

This account of the board's doings in 1929 also contains a retrospect, in outline, of the past six decades of Federal administration of Indian affairs, which was undertaken with the purpose of identifying some of the underlying causes of the present Indian situation.

In addition to its regular annual and semiannual meetings, the board held a special session in April, 1929, to confer with the secretary on some of the broader aspects of administration and received from him a program which outlined his policy for advancing the welfare of the Indians.

In its sixtieth annual report the board declares that the Secretary's announced policy should meet the general approval of fair-minded forward-looking friends of the Indian people. Its objective is plainly disclosed in the opening paragraph of the statement, "to make the Indian a self-sustaining, self-respecting American citizen just as rapidly as this can be brought about."

The board points out that a working program to effectuate a policy of acceleration which would call for speeding up of enlarged Indian Service activities purposed to bring nearer the time when all Indians would be prepared to step out from under the supervisory care of the Federal Government, would require largely in-

creased appropriation for a comparatively short time to adequately finance the carrying on of the augmented and intensified activities.

In summarizing its report the board stresses the prevalence of tuberculosis and trachoma among the Indians and declares that the health situation demands a special program for the Indian medical service, centering on a vigorous and sustained campaign against tuberculosis and trachoma, aided and abetted by largely augmented appropriations from Congress, sufficient to adequately finance the intensified medical service activities which necessarily would be brought into action and which should be carried on by tuberculosis and trachoma specialists.

Among other suggestions and recommendations offered by the board are:

Each reservation should have its particular program determined by qualified specialists sent there for that particular purpose and, where there are none, competent agricultural instructors should be detailed to reservations to lead the Indians toward a better appreciation of subsistence farming.

Any reservation economic program will fall short of its full purpose if it does not include provisions for ways and means to secure gainful labor for the Indians, especially at times when crop failure, or other causes, makes it necessary for the Indians to leave their homes to find work. The Indian Service never has had a well-planned organization to get jobs for Indians.

An Indian school which tends more and more to stress the academic at the expense of the practical, to lay emphasis on the completion of high-school courses and the attainment of college entrance credits, is losing sight of its real reason for existence, which is to prepare the Indian boys and girls eventually to take their places as self-reliant members of an American community. Indian Service schools should strive not so much for uniformity and standardization as for adaption to actual and varying needs; they should apply methods suited to the special problem of the Indian. Above all they should emphasize vocational training and the teaching of applicable and useful trades.

The Indian Service should draft a bill which would properly and adequately provide for the enforcement of law and order on reservations, have the bill introduced at the coming session of Congress, and then do all things that are proper to get the bill enacted into law.

The simple answer to the question, How shall the field service be bettered in all respects? is "Get more money from Congress and use it to make the service so attractive that the right kind of men and women for their respective places in the scheme can be secured and held on the job."

The failure of the purpose of the allotment act must be admitted. What has been done can not be undone, but the future handling of Indian lands by the

Indian Bureau should be characterized by caution and guided only by consideration for the best interest of the allottees.

The great American public is lamentably ignorant about the American Indians. The Interior Department or the Bureau of Indian Affairs would be doing only a plain duty by disseminating sane and reliable information about the American tribes and their people, about their peculiar relations to the Nation, and about the various phases of the perplexing and complicated Indian problem.

It is to be hoped that the devoted labors of reservation missionaries may yet be appreciated by church members and that the churches will encourage their home mission boards to continue and enlarge their mission activities in the American Indian country.

PENSION OFFICE

Number of pensioners.—There were on the roll at the end of the fiscal year 477,915 pensioners, as against 491,194 at the beginning of the year, a net loss to the roll of 13,279.

The number of Civil War soldiers dropped from 74,929 to 59,945, a decrease of 14,984. Of the Civil War widows, the number dropped from 197,934 to 181,235, a decrease of 16,699.

During the year 43,594 pensioners died, of which number 15,089 were Civil War soldiers, 22,429 were Civil War widows, and 3,993 were Spanish War soldiers. These losses were largely offset by the addition to the roll of 31,392 pensioners, of whom 17,945 were Spanish War soldiers and 3,489 Spanish War widows.

The highest number of Civil War soldiers on the roll was in 1898, when there were 745,822. The highest number of Civil War widows on the roll was in 1912, when there were 304,373.

The number of Spanish War soldiers on the roll June 30, 1929, was 178,804 as against 164,708 on June 30, 1928, an increase of 14,096.

The number of widows, minor children, and dependents of Spanish War soldiers on the roll June 30, 1929, was 28,643, as against 26,195 on June 30, 1928, an increase of 2,448.

At the close of this fiscal year there were still 11 widows of soldiers of the War of 1812 on the pension roll. Of the war with Mexico 1 soldier and 730 widows were in receipt of pension. (The sole survivor of the Mexican War, Owen Thomas Edgar, died September 3, 1929, at the age of 98 years 2 months and 17 days.)

On account of service in various Indian wars, 5,574 soldiers and 4,000 widows were in receipt of pension June 30, 1929.

For service connected disabilities, 14,758 soldiers were on the roll and 3,699 widows, the death of whose husbands was due to causes originating in service in line of duty.

By classes the pension roll showed at the close of this fiscal year 259,127 soldiers, 210,724 widows, 2,304 minor children, 884 helpless children, 4,423 dependent parents, and 453 Army nurses.

Disbursements.—In the fiscal year 1929 the amount disbursed for pensions was \$229,889,986.48. This amount represented the entire appropriations for 1929 plus \$603,384.18 drawn from the appropriation of \$221,000,000 for 1930. For fees and expenses of examining surgeons, \$451,680.18 were disbursed; for cost, maintenance, and expenses of pension system, \$1,276,511.65; and for per diem and expenses of field representatives, \$125,989.75.

There was expended out of the "civil-service retirement and disability fund" the amount of \$12,005,048.88 for annuities and \$4,067,423.54 for refunds. The appropriation for administration of the retirement law was \$82,900 and expenditures were \$82,557.45, of which \$70,421.29 were for personal services.

The total disbursements made by the Pension Bureau in 1929 were \$246,414,139.08, which required the issuance of 6,154,943 checks.

Applications filed and certificates issued.—On June 30, 1928, there were on file 42,589 active claims. During the year 135,708 claims were received, making a total of 178,297 before the bureau for consideration. The disposals numbered 137,015, leaving 41,282 claims on hand June 30, 1929. Of the claims disposed of 25,004 were based on Civil War service and 79,046 on Spanish War service.

During the year 84,374 pension certificates were issued, 1,074 reissues in lieu of lost certificates, 7,148 accrued pension orders, and 2,827 orders issued authorizing reimbursements for expenses of last sickness and burial of deceased pensioners amounting to \$112,627.82.

The number of pension claims allowed since the establishment of the pension system has been as follows: Original claims of soldiers and sailors, 1,517,871; reissue and increase claims, 4,157,792; claims of widows, minor children, and dependents, 1,241,207; total of all claims, 6,916,870. The total amount paid to pensioners from 1790 to end of fiscal year 1929 has been \$7,950,354,932.29.

Medical examinations.—Under the terms of a proviso of the act of March 4, 1929, making appropriations for the Department of the

Interior for 1930, claimants for pension or increase of pension are now being examined by one surgeon only, who is paid a fee of \$5 for each examination, instead of by three surgeons, as under the former board method of making examinations, each of whom received \$3 for his participation in the examination. Under this new method there is a substantial saving in the cost of medical examinations. Based on an annual average of 60,000 examinations it is estimated that a saving of at least \$150,000 per year will be effected.

Double pension—Aviation accident.—Between March 3, 1915, and March 1, 1929, double pension for disability or death due to aviation accident was payable only in Navy or Marine Corps cases. On the latter date the Congress amended the act of March 3, 1915, so as to make it applicable to officers and enlisted men of the Army. As the law now reads, any enlisted man of the Army, Navy, or Marine Corps disabled by reason of any injury received or disease contracted in line of duty the result of an aviation accident received while employed in actual flying or in handling aircraft is entitled to double pension, and should death of an officer or enlisted man occur by reason of an injury so received or disease so contracted, double pension is paid to the person otherwise entitled to pension by reason of such death.

Administration of retirement act.—During the past fiscal year the work of adjudication of claims under the civil service retirement act was practically current. Of the 32,321 claims of all classes before the bureau for action, 30,640 were disposed of, leaving 1,681 active claims awaiting responses to calls for information necessary to their final settlement.

The balance in the civil-service retirement and disability fund on June 30, 1928, was \$83,078,000.43. During the fiscal year there was added to the fund as deductions from salaries of classified civil-service employees, \$28,019,824.61, and as interest and profits, \$4,550,-042.24, making a total of \$115,647,867.28. To this amount must be added \$19,950,000 appropriated from the general fund of the Treasury. The disbursements for the year on account of annuities were \$12,005,048.88 and on account of refunds, \$4,067,423.54, a total of \$16,072,472.42. The balance in the fund June 30, 1929, was \$119,525,394.86.

OFFICE OF EDUCATION

The Office of Education has no administrative functions except those connected with the expenditure of the funds appropriated by the Federal Government for the maintenance of colleges of agriculture and the mechanic arts in the several States and Territories, and those connected with the education, support, and medical relief of natives of Alaska. It is primarily an establishment for educational research and promotion.

During the fiscal year ended June 30, 1929, the office completed its survey of negro colleges and universities throughout the United States. The results of this comprehensive study showed great advancement and an extraordinary demand among the negro people of the country for college and university education. The progress of the survey of land-grant colleges begun in July, 1927, was gratifying. Leading authorities in land-grant college education are now engaged in writing the tentative reports on the several aspects of the survey.

A school building survey was made of the Mount Vernon schools, Mount Vernon, N. Y., at the request of the board of education. A survey was also made of the junior and senior high schools of Roanoke, Va. Upon the invitation of the board of education of Huntington, W. Va., a survey was made of the school finances in that city.

Conferences.—Two important conferences in the field of education were called by the Secretary of the Interior during the latter part of the fiscal year. The first was devoted to the subject of education by radio, and the second to the relationship which should exist between the Federal Government and education in the States. The conference on education by radio, which was held on May 24, 1929, in the office of the Secretary of the Interior, was attended by educators and representatives of various radio corporations.

A conference called by the Secretary of the Interior, February 10, 1929, and participated in by Members of the House and Senate Appropriations Committees, officers of Howard University, and members of the staff of the Office of Education was held for the purpose of discussing future relationships of the Federal Government to Howard University. Since the foregoing a series of conferences have been held in the Office of Education to prepare a plan for a 20-year program of development for Howard University.

The following conferences were also called by the Commissioner of Education:

Conference of State and county supervisors of rural education of the Southern States held at New Orleans, La., December, 1928.

Conference of State and county supervisors of rural schools of the Midwestern States held at Des Moines, Iowa, June, 1929.

Library.—During nine months of the year the library division was without a librarian. An assistant educationist, who had been appointed temporarily to assist in the collecting and editing of material for the Bibliography of Research Studies in Education, left the service in June, 1928. With this decrease in staff the task of maintaining the regular work of the division and carrying on the new research undertaking has been arduous.

Two important bulletins were completed and issued during the year, namely, Bulletin, 1928, No. 22, Bibliography of Research Studies in Education, 1926–27, with 162 pages; and Bulletin, 1928, No. 23, Record of Current Educational Publications, 1927, with 116 pages.

Publications.—The whole number of documents printed in the year ended June 30, 1929, was 75, of which 47 were bulletins, 7 leaflets and circulars, 1 report of the Commissioner of Education, 10 numbers of School Life, 8 numbers of the Clip Sheet, and 2 miscellaneous publications. Of the bulletins issued, 13 were chapters for the Biennial Survey of Education.

The Clip Sheet, which was issued monthly for several years and was devoted to current news items regarding education, was discontinued during the year.

The allotment of funds for printing was \$2,500 more than in 1928, and the total output of printed matter was greater by seven documents than in the previous year. Twenty-eight manuscripts were in the files of the editorial division awaiting publication at the end of the year owing to the lack of funds available for printing.

Alaska.—Through its Alaska division, the Office of Education maintains schools, furnishes medical relief, supervises the reindeer industry, and provides assistance generally for the aboriginal races in the widely varying regions of Alaska.

The 27,000 Eskimos, Aleuts, Athabascans, and Thlingets are scattered along thousands of miles of coast from the southernmost boundary to the northernmost cape, and on the great rivers, in villages varying from 30 or 40 to 300 or 400 persons. To some of the settlements on the shores of the frozen ocean or on remote islands the annual visit of the office's vessel, the *Boxer*, furnishes their only means of communication with the rest of the world. In

many instances the school is the only elevating influence in the village.

The growth of the reindeer industry rendered it urgent that provisions be made for the allotment of grazing lands. By the act of March 4, 1927, authority was granted for the establishment by the Secretary of the Interior of grazing districts in Alaska, and for the granting of leases for definitely described areas therein. The provisions of this act are being carried into effect as rapidly as possible by the General Land Office, with the cooperation of the Office of Education's supervisor of the reindeer service. This action will regulate the occupancy of grazing lands by the reindeer herds and prevent friction among the owners of reindeer in regions where the herds are most numerous.

With the great increase in the number of reindeer and the entrance of white men into the industry, the need for scientific attention became apparent, resulting in the assignment by Congress to the Bureau of Biological Survey of the duty of making investigations in connection with the diseases and parasites affecting the reindeer; breeding, feeding, and management practices, and the grazing resources of the Territory.

In view of the fact that large numbers of reindeer are killed for food locally and for exportation, it is difficult to state the precise number in Alaska at any given date. According to a statement submitted by the general supervisor of the Alaska reindeer service, the total number in Alaska June 30, 1929, was 599,825.

Based on a preliminary survey of the grazing areas of Alaska suitable for reindeer production in 1921, it was estimated that between 3,000,000 and 4,000,000 reindeer could be supported on the 150,000 to 200,000 square miles of open grazing lands, from which 1,000,000 or more animals would be available annually for slaughter. Later investigations have shown that approximately 350,000 square miles of the Territory are of value for grazing.

The total number of pupils enrolled in the native schools of Alaska during the year was 3,660; the average daily attendance throughout the year was 2,588.31; total number of schools open, 93. During the fiscal year the sum of \$17,500 was spent for repairs on the school buildings and not counted as a part of the operation of the school. The sum of \$45,075.96 was spent for new buildings.

The radio service operated in Alaska by the War and Navy Departments has materially aided the office's work. Emergency calls by radio for the services of a physician or nurse, requests for medicines or for advice as to treatment, have time and again resulted in the relief of illness or the saving of life. Important administrative messages are promptly forwarded by radio to their destinations.

The use of the radio has mitigated the life of the teachers in many of the isolated villages, bringing them into instantaneous touch with the rest of the world.

The act of Congress entitled "An act to regulate the practice of the healing art to protect the public health in the District of Columbia," approved February 27, 1929, created a commission on licensure to practice the healing art in the District of Columbia and designated the Commissioner of Education as a member of the commission.

An act of Congress approved March 2, 1929, with respect to the licensing of degree-granting institutions in the District of Columbia charges the Board of Education of the District of Columbia with the duty of licensing such institutions but makes it the duty of all public officers and bureaus of the Federal Government concerned with educational matters to render such advice and assistance to the board of education as may be considered necessary or desirable. Such assistance has been requested of this office by the board of education and assistance in the performance of its duties has been rendered.

With the approval of the Secretary of the Interior, plans are in process of formulation for the inauguration of correspondence courses of study for the benefit of the children living on Army, Navy, lighthouse, or other Federal reservations where schooling facilities are not available. If desired by school officials of States, it is intended that such courses will be made available for the instruction of children in isolated communities, especially in communities where the small number of children makes it inadvisable to establish regular schools. Toward the close of the year a member of the office's staff visited Toronto and Winnipeg, Canada, with a view to securing information regarding the conduct of correspondence courses as carried on in Canada. It is hoped that this work may be inaugurated during the fall of 1929.

Recommendations.—During the six and a half months which have passed since the present incumbent became Commissioner of Education he has given serious consideration to three major issues:

First. Plans for a nation-wide survey of secondary education for which Congress has authorized the expenditure of \$50,000 during the current fiscal year, and \$100,000 and \$75,000 in the two succeeding years, respectively.

Second. A reorganization of the personnel of the Office of Education with a view to carrying out in the most effective way the purposes for which the Office of Education in the Department of the Interior was created, and to answer in some small measure new demands which appear to be proper functions for the office to perform.

Third. The effectiveness of the work in Alaska and the reorganization of a type that will meet the present needs and in so far as possible relieve the Commissioner of Education of administrative responsibilities.

Only in the education of the natives of Alaska does the Commissioner of Education exercise any administrative authority over American schools, and here, curiously enough, are included responsibilities not usually assigned to school administrators, namely, hospitalization, oversight of certain trading and other financial operations, and the supervision of the reindeer industry. He makes the following recommendations regarding the school service:

A. That the seat of authority to administer should be located as near as possible to situations demanding attention. This would seem to demand the transfer of the chief of the Alaska division from Seattle to Juneau, or possibly Anchorage. This transfer is respectfully recommended even if no other changes at this time are contemplated.

B. That the officer charged with administration of Alaskan affairs be given large discretionary powers. In the past many matters which could have been settled on the ground in the light of broad policies laid down in Washington have been referred to the Commissioner of Education or an assistant secretary of the department for action, causing serious delays.

C. That financial obligations properly incurred be settled promptly. If this is to be the policy of this department, a disbursing officer representing the department in Alaska is required.

D. That as rapidly as possible the office of Commissioner of Education be relieved of such responsibilities for the Alaskan service as are primarily administrative in character. The adoption of this policy would involve—

1. Transfer of the oversight of the reindeer industry to other representatives of the Department of the Interior.

2. Transfer of the oversight of certain financial transactions to another representative of the Department of the Interior, perhaps to the commissioner who represents the Secretary in Alaska. This would include the so-called Alaska trust fund, which probably should not be terminated for a few years, since there are still parts of Alaska not cared for by traders and other parts where the natives should not be left to the mercy of persons who possess a monopoly in this field. This work has been admirably administered by A. H. Miller, who has rendered faithful and unselfish service to natives for many years. This recommendation would also cover the services rendered by the Alaska division to the village of Metlakatla on Annette Island and general supervision of cooperative stores. Who-

ever exercises oversight of this financial work in Alaska will doubtless find that it is still desirable to utilize the services of the teachers in the native schools to assist in keeping records of accounts of the native cooperative stores.

3. A transfer of the hospitals and their staffs to another representative of the department and the development of a policy which will tend to coordinate the health work for the natives with the health work for the whites under the health service of the Territorial Government. If this service should remain in the Office of Education, the chief of the Alaska division insists that there be a general supervisor for the medical activities. Alaska is a land of such sparse population and vast area that it seems unwise to develop two overhead organizations, one Federal and one Territorial.

GEOLOGICAL SURVEY

Geologic work was done in 42 States and Alaska, and 13 of the States cooperated in this work.

The search for potash was continued in the Permian salt basin of southeastern New Mexico and western Texas. Samples for potash testing were obtained from nearly all wells being drilled in this area. Four Government tests in Texas were completed during the year, and four sites in New Mexico were recommended for test during the fiscal year 1930. Beds containing potash salts were found in all the Government tests, and since the end of the year one of the beds has been determined to be of prospective commercial value.

Study of the mining geology of Colorado was continued in cooperation with the State and the Colorado metal-mining fund.

Study of the mining districts in the greater Helena mining region, Montana, was continued in cooperation with the city of Helena.

Contributions were made to geologic maps of Arkansas, Pennsylvania, Texas, and Virginia for publication by the respective States.

A geologic map of the Grand Canyon was prepared and transmitted to the National Park Service for use in the museum at Yavapai Point.

A preliminary study of physiographic features of the Mississippi Valley from Wisconsin to the Gulf and of the lower valleys of the principal tributaries was made for the purpose of planning a systematic investigation of the regimen, deposits, and geologic history of these rivers.

A tract of 1,000 square miles near Mount Spurr, in the Alaska Range, was covered by geologic and topographic surveys. The technical men reached this area by airplane from Anchorage in 80 minutes; the pack train carrying their supplies was more than 20 days on the route. Airplane transportation is especially advantageous in Alaska on account of the shortness of the working season.

Topographic studies were made in connection with the Navy Department's airplane photographing expedition in the northern part of southeastern Alaska.

Reconnaissance topographic mapping in the Ketchikan district of southeastern Alaska utilized the drainage maps compiled from the aerial photographs taken by the Navy Department in 1926.

An arrangement was made whereby the Geological Survey will supply to the Alaska Railroad the services of an engineer or geologist for a part of the year to assist in solving geologic problems that may arise in the railroad work.

The topographic surveys made during the year covered more than 17,000 square miles and increased the proportion of the total area of the continental United States, exclusive of Alaska, mapped from 43.2 to 43.6 per cent. In this work 25 States cooperated.

Measurements of stream flow were made in 47 States and Hawaii, and the number of gaging stations was increased from 1,830 to 2,238. In this work cooperation was furnished by 35 States and Hawaii, also by other Government units.

A comprehensive study of well-drilling methods has been begun, and assistance has been rendered to several State associations of well drillers.

Numerous samples of water from the Colorado and other rivers were examined to determine their content of dissolved and suspended mineral matter.

The work of classifying public and Indian lands with respect to mineral content and of supervising mineral operations on such lands was carried on in 21 States and Alaska. The results accomplished include a net decrease of 55,549 acres in area classified as mineral in character and an increase of 1,688,316 acres in outstanding mineral withdrawals. There were net increases of 245,808 acres in power reserves, of 142,493 acres in enlarged-homestead designations, of 1,141,957 acres in stock-raising homestead designations, and of 15,040

acres in public water reserves. The royalties, rentals, and bonuses accrued from all mineral operations on public lands amounted to \$4,100,069, more than 89 per cent of it from oil and gas operations. Inspectional, regulatory, and advisory service was rendered in connection with the leasing of mineral deposits on Indian lands in seven States, on which the royalty value amounted to \$7,500,000. Supervision over oil and gas operations on naval petroleum reserves was continued, and the royalty value resulting from these operations was \$1,817,464.

The outstanding publications of the year comprised an elaborate report on the copper deposits of Michigan, a series of studies of Basin Range structure, a report on the Mother Lode system of California, a manual of instructions for the topographic work, a geologic map of New Mexico, several of the series of large-scale maps of Los Angeles County, Calif., and of Chicago and vicinity, and three of the series of land-classification maps of the central Great Plains with descriptive text.

THE BUREAU OF RECLAMATION

The area irrigated in 1928 with water from Government works was 2,677,100 acres, an increase of 149,995 acres over that of 1927.

The area cropped was 2,681,270 acres, an increase of 177,224 acres.

The total value of crops was \$143,573,070, an increase of \$10,365,-860 compared with 1927.

Since water was first available for irrigation in 1906, the cumulative value of crops grown on land furnished with water from Government works amounted to \$1,481,087,800.

The construction payments were \$4,387,813.30, an increase of \$932,-049.11 compared with the previous year.

The payments received for operation and maintenance were \$1,920,-500.57, or \$77,115.71 greater than in the previous year.

The total payments in the fiscal year 1929 amounted to \$6,308,314.37, compared with \$5,299,149.55 in 1928, an increase of \$1,009,164.82.

The income to the Bureau of Reclamation during the fiscal year was \$9,851,438.62, or \$548,108.37 greater than in the previous year.

The operation expense for the year was \$1,786,928.81, an increase compared with the previous year of \$23,976.14.

Excess of operation and maintenance receipts over expense for the period amounted to \$133,571.76, compared with an excess of \$80,432.19 for the previous year.

The amount appropriated for construction was \$12,286,500, compared with \$9,869,000 the previous year, both figures exclusive of reappropriations.

The amount expended on construction was \$7,898,304.69, compared with \$6,966,449.25 the previous year.

Stony Gorge Dam, on the Orland project, California, was completed in October, 1928. Gibson Dam, on the Sun River project, Montana, was practically completed at the end of the fiscal year. Echo Dam, on the Salt Lake Basin project, Utah, was about 40 per cent completed, and the 405-foot Owyhee Dam, on the Owyhee project, Oregon-Idaho, about 14 per cent. Work continued on the construction of the Easton diversion dam and the canal system on the Kittitas division of the Yakima project, Washington, and on the main canal and Harper diversion dam, on the Vale project, Oregon.

The total length of canals, ditches, and drains constructed to the end of the fiscal year amounted to 16,557 miles. Tunnels numbered 122, and totaled 175,536 feet in length. Concrete and wood canal structures numbered 148,462; bridges, 11,631, with a total length of 277,449 feet; and culverts, 14,043, with a total length of 535,396 feet. The amount of concrete, metal, tile, and wood pipe laid to the end of the fiscal year amounted to 4,091,096 linear feet, and there had been constructed 4,811 concrete, metal, and wood flumes totaling 853,022 feet in length. Telephone lines amounted to 3,350 miles, and transmission lines, 2,056 miles. The 35 power plants developed 166,128 horsepower. Excavation during the fiscal year amounted to 9,996,368 cubic yards of earth, indurated material, and rock, bringing the total to the end of the year to 276,822,500 cubic yards. Riprap totaled 2,533,787 cubic yards; paving, 1,080,328 square yards; and concrete placed, 4,191,553 cubic yards.

One of the outstanding events in the history of the Bureau of Reclamation was the approval by President Coolidge on December 21, 1928, of the Boulder Canyon project act, providing for the construction of Boulder Dam and the development of the Colorado River Basin. The act became effective on June 25, 1929, through proclamation by President Hoover. The bureau has been actively

engaged in preparing for the work of construction, funds for which are contingent upon the entering into of contracts for the sale of power sufficient to return the cost of the work within 50 years, with interest at the rate of 4 per cent. Conferences were held with representatives of various States, municipalities, and power companies interested in such contracts, and it was early evident that applications would be received for more power than could be developed at the dam.

Numerous conferences were held with officials of the Union Pacific system to evolve the most feasible scheme for rail facilities to the dam site. A site for the construction camp has been selected, and plans are being perfected for the health and comfort of the workmen during the period of construction.

A contract was entered into with the Imperial irrigation district and the Coachella Valley County water district, which provides for a maximum expenditure of \$100,000, payable equally by the United States and the two districts, under which the bureau has placed a force of men in the field to make the necessary surveys and investigations to determine definitely the location and estimated cost of the proposed all-American canal. When completed this canal would do away with the present canal serving the Imperial Valley of California and running for 60 miles through Mexican territory.

There were on the projects in 1928, 40,788 irrigated farms, with a population of 153,663. The project towns numbered 212, with an additional population of 451,811. Included in the towns and in the irrigated area were 687 schools, 689 churches, and 136 banks with deposits of \$147,732,900, the main portion of which came from the residents in the towns and surrounding irrigated farms.

During the year 28 public land farm units were opened to entry on the Tule Lake division of the Klamath project, Oregon-California, all of them being taken up almost immediately by qualified applicants. In July, 1928, and in June, 1929, part 2 and part 3 of the Willwood division of the Shoshone project, comprising 25 and 29 farm units, respectively, were opened to entry, and at the end of the year these units were being steadily entered by farmers selected on the basis of approved qualifications of industry, experience, character, and capital.

Through the cooperation of the Lower Yellowstone Development Association a number of families were brought to the project, and several farms on which the Government held options were sold. Lack of farm buildings on a number of the farms has deterred active settlement on this, as well as on the Belle Fourche and Orland projects, where the Government holds similar options.

During the summer the Secretary of the Interior approved an economic survey of reclamation on a few projects where settlement and development have been unduly prolonged. These included projects built by the Government, new projects now under construction, private projects taken over by the Government or requesting that such action be taken, and projects merely receiving water from Government works under Warren Act or other water-service contracts. The reports of the investigations will be correlated by a special committee which will prepare a final report and recommendations to the Secretary with a view to making constructive suggestions as to what can and should be done to improve conditions on these projects, and to aid Congress in enacting desirable legislation.

Little was done by the bureau in connection with the investigations of planned group settlement in the South other than a preliminary survey of a tract of land in North Carolina and of five tracts in Florida. During the fall of 1928 a study of economic and social conditions in the South was made by Dr. E. C. Branson, of the University of North Carolina, and his report was published by the bureau under the title "Planned Colonies of Farm Owners."

The investigations made by the Bureau of Reclamation in the South have shown conclusively that this section of the country has all the material conditions for an attractive and prosperous rural life. It has fine transportation facilities and is near the largest cities of the country. The climate and soil make it possible for this region to be self-supporting in an agricultural sense and to supply some of the most needed and most valuable products of the country. It needs, however, a well-rounded agricultural program. There are many sections which should be hopeful and prosperous which now have a declining rural life. This is wholly due to economic and human conditions which can and should be improved.

THE NATIONAL PARK SERVICE

On January 8, 1929, Stephen T. Mather, Director of the National Park Service since it was established in May, 1917, and previously, from January 21, 1915, assistant to the Secretary of the Interior in charge of national parks, resigned on account of impaired health. He was succeeded on January 12, 1929, by Horace M. Albright, assistant director (field) and superintendent of Yellowstone National Park.

TRAVEL

The largest travel yet recorded to the national parks and monuments occurred in the year just ended. A total of 2,680,597 persons visited the national parks and 567,667 the national monuments. This total of 3,248,264 is an increase of 223,420 persons, or 7 per cent, over the previous high record of 1928.

INCREASE IN PARK AND MONUMENT SYSTEM

The establishment of the Grand Teton National Park by act of Congress approved February 26, 1929, added the twenty-first national park to the system. The Arches National Monument, established by presidential proclamation last April, is the thirty-third monument to be placed under the jurisdiction of the National Park Service. Additions were also made to existing national parks through congressional action in making boundary adjustments. Yellowstone National Park was enlarged by the addition of 78 square miles through boundary revisions on the north and east, and in the northwest corner. Lassen Volcanic National Park was enlarged by the addition of 39 square miles of interesting volcanic area. The Lafayette National Park, in Maine, was enlarged to 16 square miles and its name changed to Acadia. Authority was also given the President to enlarge Yosemite National Park, and under this authority about 7,000 acres will be added to that park.

The area of the national-park system now totals 12,118 square miles, while that of the monument system administered by the National Park Service is 3,728 square miles.

PROPOSED BOUNDARY ADJUSTMENTS

The most important boundary survey undertaken during 1928-29 was that made by the Yellowstone Boundary Commission appointed by President Hoover. Special study was made of the southwestern

and southeastern sections of the park. The addition of the Upper Yellowstone region, long proposed by park authorities for extension to the southeast, would give a natural boundary to this section, while at the same time adding rugged wilderness country of exceptional beauty. The Upper Yellowstone country, with the adjoining portion of the present park, constitutes one of the largest wilderness areas remaining in America, and should all be within the national park. The commission is engaged in gathering further data on the boundary question and in preparing its report for submission to the President.

Studies of boundary adjustments for both Zion and Bryce Canyon National Parks, in southwestern Utah, are also under consideration. The areas proposed for inclusion contain scenery of the first order.

EASTERN NATIONAL PARK PROJECTS

Interesting progress is being made on the project to establish the Great Smoky Mountains National Park in the States of Tennessee and North Carolina. Already one-half of the minimum area of 427,000 acres specified by Congress has been either purchased or optioned for purchase, and it is hoped that within two years, and possibly less, this minimum area will have been acquired and the park actually established.

The proposed boundary line of the Shenandoah National Park project, at the request of the State of Virginia, was studied and laid out on the ground. Unfortunately, little more than half the funds estimated as necessary to purchase the lands for this proposed park have as yet been pledged.

The Mammoth Cave National Park Association has made considerable progress toward acquiring land for the proposed Mammoth Cave National Park. For this project there has been reported subscribed so far, in money and property, \$1,100,000, and important purchases have been consummated.

THE OUACHITA PROJECT

The Ouachita National Park project is still pending through a bill introduced in the first session of the Seventy-first Congress. The area proposed for inclusion in this park project was examined on the ground jointly by representatives of the National Park and Forest Services, and later was investigated again by a special representative of the Park Service. Both these investigations proved conclusively that the area contains no distinctive scenic or other features that

would meet national-park requirements, and, based on these findings, an adverse report on the project was submitted to Congress by the Secretary of the Interior. Despite this report, the bill passed both Houses of Congress and went to President Coolidge for consideration. It was among the measures which failed to receive presidential approval before the close of the last administration.

DEVELOPMENT OF EDUCATIONAL OPPORTUNITIES

Impetus was given to the development of educational facilities within the national parks during the past year by the studies and report of the informal committee appointed to make a thorough investigation of the educational possibilities in these areas. Studies were made in all the major national parks and a number of the national monuments during the summer. Members hope that the final report of the committee, which is functioning on a two-year basis, may be submitted during the coming winter.

As a direct result of the activities of this committee, and in line with its recommendations, an advisory board was created to assist the Director of the National Park Service on matters pertinent to educational policy and developments in the national parks.

Upon the recommendation of the advisory board an appropriation was requested in the 1931 estimates for the establishment of an educational division in the headquarters of the National Park Service at Washington, to coordinate properly the various educational phases of park work.

Museum expansion continued in Yellowstone National Park under the grant of \$118,000, which the American Association of Museums obtained from the Laura Spelman Rockefeller Memorial over a year ago for museum development in that park. The museum of hydrothermal phenomena at Old Faithful, commenced last year, was completed and opened to the public early in the season. It proved to be exceptionally popular. A similar smaller museum is being constructed at Norris Geyser Basin, and a third branch museum is under construction at Madison Junction, near the site of the historic campfire at which the national-park idea was born and the fate of the Yellowstone settled. The museum in Yosemite National Park, established in 1924 through the cooperation of the American Association of Museums and the Laura Spelman Rockefeller Memorial, served nearly half a million people during the

year just ended. Museum service was provided at Lassen Volcanic National Park through the gift of a complete museum and the 40 acres of land on which it stands to the United States Government by B. F. Loomis, of California. It contains exhibits relating to the volcanic history of Lassen Peak, and an exhibition seismograph, open to public inspection at all times, is installed in a building operated in connection therewith. The museum at Mesa Verde National Park, made possible entirely through gifts, was very popular during the season and received some interesting acquisitions as a result of archeological work conducted last spring. Small museum collections were available in some of the other parks and in several of the prehistoric southwestern monuments.

ARCHEOLOGICAL INVESTIGATIONS

Archeological investigations were carried on in Mesa Verde National Park by Jesse L. Nusbaum, superintendent of the park and archeologist for the Department of the Interior. As a result of these annual investigations and the restoration of material found the largest and most comprehensive exhibit on the archeology of the Mesa Verde now available to the public is contained in the park museum.

Some excavation work was done at the Chaco Canyon National Monument by the School of American Research of Santa Fe, and repairs were made to the ruins in several of the other southwestern monuments by Park Service officers.

PROTECTION OF PARK FORESTS

The Director of the National Park Service continued to act as a member of the forest protection board, organized under an order issued by the Chief Coordinator in January, 1927. The purpose of this board, as broadened with the approval of the coordinator, is to formulate and recommend general policies and plans for the protection of the forests of the country. Upon the recommendation of the National Park Service, regional boards were organized representing the different Federal agencies concerned. A close study of the entire situation in each region has been made by the regional boards and plans made for the necessary protective work on publicly administered lands.

Under the direction of the fire-control expert appointed last year detailed surveys of the fire hazards in a number of parks were made

and comprehensive plans worked out for the prevention and suppression of forest fires in these areas. Fire schools were also conducted in several of the parks, and in addition many national park rangers attended fire schools conducted in near-by national forests. So effective were the control methods employed that fires originating within national parks were held down to a minimum despite the fact that fire hazards were increased by the abnormally dry conditions. The serious Half Moon fire which menaced Glacier Park, referred to later in this report, originated outside the park.

The effectiveness of insect-control measures taken by the Bureau of Entomology and the National Park Service during recent years became evident during the past season, when infestation conditions in parks recently under control were better than for several years past.

CONDITIONS OF PARK FAUNA

Wild-animal conditions in the national parks were excellent, due to the generally favorable winter weather and good forage crops.

Several interesting studies of wild-animal problems were inaugurated during the past year through the cooperation of interested organizations and individuals. Funds for a comprehensive two-year survey of the wild life of all the national parks were provided by George Wright, who has been interested in national-park work for several years. The object of this investigation, in which Mr. Wright is being assisted by Mr. Joseph Dixon, of the University of California Museum of Vertebrate Zoology, is to study first such outstanding problems as the bear and deer problems in Sequoia and Yosemite Parks, the elk situation in Yellowstone and Yosemite Parks, and the mountain sheep, caribou, wolf, and coyote problems in Mount McKinley.

With funds provided through the generosity of another park friend, Mr. Thomas Cochran, of New York, a special survey of the Yellowstone elk herds and the life habits of these animals was conducted by William Rush. Studies of both winter and summer conditions were made. Intensive investigations were also conducted by the Bureau of Biological Survey of elk conditions in the Jackson Hole.

The Museum of Vertebrate Zoology of the University of California continued a survey of the animal life of Lassen Volcanic National Park under the direction of Dr. Joseph Grinnell.

FISH-CULTURE WORK

Through a cooperative arrangement between this department and the Department of Commerce, a fish culturist has been detailed by the Bureau of Fisheries to supervise fish-culture operations in the national parks and monuments. Under the plan of cooperation the fish culturist will devote his time during the summer to piscatorial problems in the national parks, and during the winter months will direct fish-cultural operations at hatcheries of the Bureau of Fisheries located at points outside the parks.

PARK ROAD DEVELOPMENT

Work was continued on park roads under the program which calls for an ultimate expenditure of \$51,000,000 on a 10-year basis. A total of \$5,000,000 was appropriated for road construction during the 1930 fiscal year. Of this amount \$4,000,000 was covered by contractual authorizations permitted by the 1929 appropriation act, and \$1,000,000 was made available in cash for current work. In addition authority was given to contract for additional work up to \$2,500,000.

All major highway construction was carried on by the Bureau of Public Roads under the cooperative arrangement between the Departments of Agriculture and Interior.

APPROPRIATIONS AND REVENUES

Appropriations for the national parks and monuments for the fiscal year 1929 amounted to \$4,754,015, with additional authority to enter into contractual obligations for road work up to \$4,000,000. The 1930 appropriations were \$7,595,940, with additional authority to enter into contractual obligations for road work up to \$2,500,000 and with further authority to enter into such obligations for the purchase of private holdings within national parks up to \$2,750,000, provided that in the expenditure of this latter fund each dollar of Government funds expended in the purchase of private lands is met by a dollar of donated funds.

Revenues derived from the national parks and monuments during the 1929 fiscal year amounted to \$849,272.95, an increase of \$41,017.14 over the 1928 revenues and of \$22,818.78 over the record 1926 revenues.

THE TERRITORIES

The act of March 1, 1873 (17 Stat. 484), authorized the Secretary of the Interior to thereafter exercise all the powers and perform all the duties relating to Territories that were, prior to March 1, 1873, by law or by custom exercised or performed by the Secretary of State. Under this enactment all the organized Territories created or existing since 1873 have been under the general supervision of the Secretary of the Interior.

ALASKA

The Governor of Alaska, Hon. George A. Parks, in his report for the fiscal year ended June 30, 1929, states that the economical and industrial conditions in the Territory are satisfactory.

ECONOMIC CONDITIONS

The combined value of the products from fishing and mining, the major industries of the Territory, shows an increase for 1928 of about 25 per cent over that of 1927. This increased production was accompanied by an increase in the capital investments and the number of persons employed. During the year labor was employed in nearly every section of the Territory, and there were no labor controversies of any kind.

The balance in the Territorial treasury at the close of business June 30, 1929, was \$1,059,153.51. The combined resources of the Territorial and national banks in the Territory on June 29, 1929, were as follows: Capital, \$915,000; surplus and net undivided profits, \$815,100; deposits, \$12,754,500. Approximate totals for the previous year were: Capital, \$915,000; surplus and net undivided profits, \$820,250; deposits, \$12,196,500. The increase of more than \$500,000 in deposits is significant of the improved economic conditions. The total assessed valuation of incorporated towns for 1929 was \$23,444,571, an increase of \$753,885 over 1928. Federal income-tax collections from Alaska, as reported by the collector of internal revenue, increased 5 per cent over 1927.

The report of the collector of customs for the calendar year 1928 shows a gratifying increase over 1927 in the value of commodities produced in and shipped from the Territory. The total value of exports is \$74,849,918, or \$17,288,271 more than for the previous

year. Imports were valued at \$32,636,833, or \$3,739,537 less than 1927. The balance of trade in favor of Alaska is \$42,213,085, as compared with \$20,566,605 for last year, an increase of more than 50 per cent. The increase is accounted for almost entirely by the large salmon pack. The outstanding feature of the year from an economic viewpoint was the remarkable improvement in the production of the salmon fisheries.

FISHING INDUSTRY

As compared with the number of salmon caught in 1927 the catch in 1928 discloses an increase of approximately 86 per cent. This is accounted for primarily by the large runs of red salmon in western Alaska and pink salmon in the southeastern district. The most notable increases were 227 per cent in southeastern Alaska and 66 per cent in western Alaska. The value of the fisheries products, exclusive of aquatic furs, was \$54,545,588, an increase of \$14,382,288 over 1927. This represents the worth of manufactured product. It is estimated that the value of the catch to the fishermen was approximately \$17,343,000. Salmon and herring make up the principal part of the catch. The round weight of salmon catch landed by fishermen was approximately 517,069,403 pounds and of herring approximately 134,020,216 pounds. Thirty-one thousand and eighty-six persons were employed in the commercial fisheries in 1928, an increase of 2,214 over the preceding year. Of these 17,326 were whites, 5,614 were natives, and the rest Filipinos, Japanese, Chinese, Mexicans, and Negroes, in the order named.

The value of the canned salmon in 1928 represents about 96 per cent of the total value of the industry. Twenty-four thousand four hundred and twenty-eight persons were employed to can 6,083,903 cases, valued at \$45,383,885. One hundred and fifty-three canneries were operated as compared with 145 in 1927.

The production of mild-cured salmon, while considerably less than in 1927, was not below the average for the past several years. Twenty plants were operated and employed 1,970 persons to pack 4,193 tierces of kings, 1,650 tierces of cohoes, and 7 tierces of chums, a total of 5,850 tierces, valued at \$1,101,871. Efforts to utilize the by-products of the canning industry have been successful, and during the season 1,421,644 pounds of fertilizer, valued at \$44,109, and 43,390 gallons of oil, valued at \$16,420, were derived from this source.

The total production of the herring industry was somewhat greater than in 1927. An important feature was the discovery of large schools of herring in the vicinity of Dutch Harbor. Sixty-five plants, employing 1,992 persons, produced 16,056,595 pounds of Scotch-cured herring, 20,004,164 pounds of meal, 2,543,600 gallons of oil, and 6,553,266 pounds of bait, valued at \$3,098,457, in 1928.

The halibut industry suffered a decline in prices and in the quantity of fish caught in 1928. One thousand two hundred forty-one persons were employed in this industry and they caught 31,567,000 pounds, valued at \$3,094,000, as compared with 34,491,283 pounds, valued at \$3,805,088, in 1927. The problem of preserving the halibut fisheries has occupied the attention of the International Halibut Commission for several years and as a result of their investigations it is apparent that the fishing grounds bordering Canada and Alaska have been seriously depleted. If these fisheries are to be rehabilitated, it is probable that fishing will have to be restricted for a period of years. The output from the cod fisheries declined about 50 per cent under last year because none of the large plants were operated. There was a sharp decline in the whaling industry, both in the number of people employed and the value of the catch. Two hundred and thirty persons captured 402 whales, which yielded 730,650 gallons of oil, valued at \$343,786; 93,750 gallons of sperm oil, valued at \$36,748; and 1,326 tons of fertilizer, valued at \$73,740, or a total of \$454,274 as compared with \$622,412 in 1927.

SEALING

The census of the seal herd on the Pribilof Islands is computed in August each year, and the Bureau of Fisheries estimates the increase for 1928 to be 62,643, or 7.7 per cent. The total number of seals of all ages and classes in the herd on August 10, 1928, is given as 871,513. In 1911, when the Government assumed control of the herds, there were about 132,000 seals of all classes on the islands, and the results that have been achieved in building up the herds to more than six times the original herd in 18 years is a striking example of what may be accomplished by proper methods of control and wise utilization of the surplus.

While the herds have been increasing, they have been made to produce many thousands of sealskins for the market, and each year the number of marketable skins increases. Only bachelor seals are taken for their skins. The seal industry will continue to be a source of revenue, and there is no longer danger of the extermination of the herds so long as they are maintained under the supervision of the Government.

Thirty-one thousand and ninety-nine sealskins were taken from the Pribilof Islands herds during the calendar year 1928. This is an increase of 6,157, or 24.2 per cent, over the catch for 1927. During the year 28,929 skins were sold at public auction and at private sales authorized by the Secretary of Commerce for a total of \$896,383.40. In 1927 20,315 skins were sold for a gross price of \$718,101. The revenue derived from the Pribilof Islands is augmented by the trapping of white and blue foxes, which are fed with

the by-products of the sealing industry. During the trapping season 1928-29 544 blue and 9 white fox skins were taken and prepared for market. October 15, 1928, 278 blues and 15 whites, taken the previous season, were sold at public auction for \$21,290.

MINING

In 1928 the total value of all mineral products is reported to be \$14,128,000. This is \$176,000 under the 1927 valuation. The decline is due wholly to the decrease in the quantity and value of copper that was mined. Although the total mineral production is less than that for 1927, it is significant that the gold production increased very materially. The mining industry has been stimulated during the past year by new developments and by assistance given to prospectors; hence it is almost certain that the production from the mines will show an increase next year.

For many years the production of gold from placer mines exceeded that of the lodes, but in recent years there has been a gradual change in the situation, and last year the production from the lodes exceeded that derived from the placers. The total gold production from all sources in 1928 is estimated to be \$6,775,000, as compared with \$5,927,000 in 1927.

Copper-bearing rocks are distributed throughout the territory but commercial-ore bodies are mined in only two localities, Kennecott, in the Copper River district, and on Latouche Island. The production from these mines shows a sharp decline. In 1927 the value of the copper was estimated to be \$7,250,000, while in 1928 it decreased to \$6,100,000. There has been a steady decline in the production of copper each year since 1923, and further decrease is inevitable unless new ore deposits are discovered.

Approximately 75 per cent of the silver produced in the Territory is recovered from the copper ores, hence the decline in copper production is accompanied by a decrease in the output of silver. The value of the silver recovered is estimated to be \$273,000 as compared to \$356,000 in 1927.

An increase is noted in the production of lead, marble, limestone, tin, and platinum. During the year a new industry was initiated on Dall Island, situated about 50 miles west of Ketchikan. The Pacific Coast Cement Co. opened a quarry for the production of limestone to supply a cement plant located near Seattle. This quarry has a capacity of several thousand tons per day and no doubt will continue in operation for many years. Alaska contains large quantities of suitable limestone and largely increased production may be expected.

The coal mines in the Territory produced 125,289 tons, valued at \$624,000. This is 20 per cent greater than last year and exceeds the production of any previous year. Practically all of the coal is produced in two districts, both tributary to the Alaska Railroad. The Matanuska Field near Anchorage and the Healy River area near Fairbanks supply their respective districts.

Petroleum was produced in only one district in the Territory. A number of shallow wells near Katalla in the vicinity of Bering River produce a small quantity of paraffin-base oil. This is refined locally and the various distillates are sold in local markets.

TRANSPORTATION

The report of the general manager of the Alaska Railroad discloses that there was a decrease in the revenues derived from transportation of freight and passengers. The revenue from the river boats that are operated in conjunction with the railroad increased about 3 per cent. The revenue from all sources, including nonoperating income, was \$1,269,634.07, and the total deficit, all expenses except charges to capital account, was \$950,711.74. Shipments of coal increased 16 per cent, but this was not sufficient to overcome the decline in shipments of machinery and construction supplies to the Fairbanks Exploration Co. In the interest of colonization along the railroad a traveling representative was appointed, and he has been visiting farming communities in various sections of the West for the purpose of furnishing information to individuals and prospective settlers. It is expected that through his efforts the population along the railroad will be increased.

There was a gratifying increase in the tourist travel, and it is expected that with the completion of the wagon road through Mount McKinley National Park there will be a marked advance in the number of visitors each year.

LUMBERING

The national forests of Alaska embrace an area of approximately 21,000,000 acres and contain the greater part of the commercial timber in the Territory. These forests are administered by the United States Forest Service, Department of Agriculture, and their value to Alaska and the Nation may be appreciated when it is understood that they comprise 13 per cent of the total forest reserves of the United States and contain about 85,000,000,000 board feet of timber. Investigations by the Forest Service indicate that the forests will yield 1,000,000,000 board feet each year in perpetuity and that the present yearly cut is 56,000,000, or 5.6 per cent of what can be taken without danger of depleting the supply.

Much of the timber, especially in the Tongass Forest, is valuable chiefly for the manufacture of pulp and paper. Large areas have been awarded under contracts to paper-manufacturing companies and the preliminary plans for construction of the necessary plants have been completed. It is known that there are more than 550,000 horsepower as yet undeveloped in the regions tributary to the forests. The utilization of this power and the timber resources will place the manufacturing of pulp and paper in the list of Alaska's major industries.

ROADS

The Territory cooperates with the Federal Government in the construction of roads and trails. The Alaska Road Commission, War Department, is responsible for the construction of roads and trails outside of the national forest areas, and the Bureau of Public Roads is charged with similar work in the forest reserves. In the biennium 1927-28 the Territory appropriated \$500,365.41 for roads, trails, and aviation fields, and the cost of administration to the Territory was 1.5 per cent of this amount. This clearly shows the benefits of the cooperative arrangements. In 1928 the new construction consisted of 45 miles of road, 48½ miles of sled road, 104 miles of trail, 440 linear feet of bridges, 10 airplane landing fields, and 23 shelter cabins. During the same period 27¾ miles of road were reconstructed, 65 miles of road were surfaced, 2¾ miles of tramway constructed, and 1,271¼ miles of road, 84¼ miles of tramway, 742½ miles of sled road, 4,389¼ miles of permanent trail, 314 miles of temporary trail, 736 miles of telephone line, 27 airplane landing fields, and 26 shelter cabins were maintained. The total expenditures in 1928 for all activities was \$1,447,163.91.

Since March 1, 1927, all roads within national forests have been constructed and maintained by the Bureau of Public Roads. The funds expended by this organization are provided by the Federal highway act and Territorial allotments. The total amount expended for roads in and adjacent to the national forests is \$4,618,989, and of this sum \$325,593 has been contributed by the Territorial road board.

Two hundred and four and five-tenths miles of highway have been constructed, and in 1928 an additional 17.3 miles were under construction. A total of \$573,869.13 was expended during the year, and of this about \$40,000 was derived from Territorial allotments. The development that has taken place along the highways affords ample justification for the expenditures that have been made by this organization. A comprehensive program has been prepared, and it is believed that the needs of each community have been anticipated.

BUREAU OF MINES

The United States Bureau of Mines maintains a fully equipped mine-rescue car on the Alaska Railroad, and throughout the year a representative of the bureau visits the larger mining camps in the Territory, giving instructions to miners and subordinate mine officials in mine safety service and mine-rescue methods. In cooperation with the Alaska Agricultural College and School of Mines, the Bureau of Mines conducts a laboratory in the college at Fairbanks where prospectors and miners may have samples assayed at cost and qualitative determinations made free of charge.

CARE OF INSANE

The legally adjudged insane from the Territory have been cared for under contract at Morningside Hospital, near Portland, Oreg., for 25½ years. During this period 1,253 patients have been admitted to the institution, and there are 241 now confined for treatment. The present contract expires this year and a new one has been made for the next five years. During the next period it is expected that plans will be perfected whereby an institution will be provided in Alaska. Arrangements have been made for a doctor employed by the Government to be stationed at the institution in Portland, and he will have authority to examine the patients and represent the Interior Department. This is a decided improvement over the practice that has existed in the past and should be of advantage to the institution and to the patients.

AVIATION

Commercial aviation in Alaska began about seven years ago when the first contract for carrying United States mail between Fairbanks and McGrath was awarded in Fairbanks. Since that date rapid progress has been made in this method of transportation. The Territorial government expends annually 30 per cent of the road appropriation for the construction of landing fields, and there are at the present time 67 fields situated in strategic places in the interior of the Territory. The economic value of this method of transportation and the resulting benefits in the development of the Territory can not be overestimated. The feasibility and practicability of flying at all seasons of the year has been demonstrated beyond question. Practically all of the pioneer work in aviation in Alaska has been done by private interests. The Territory occupies a strategic position on the proposed air routes from Europe and Asia and the Federal Government should provide an airport for the use of the Army and Navy.

EDUCATION

The schools of Alaska are supported by the Federal Government by direct appropriation and by the Territorial government from Territorial revenues. For the biennium 1929-30 the legislature appropriated \$1,074,300 for the maintenance of Territorial schools and the Alaska Agricultural College and School of Mines. The schools are classified in three divisions, namely, schools in incorporated cities and incorporated school districts, schools outside of incorporated cities but in established school districts, and special or co-operative schools which are maintained in communities where the number of children of school age does not meet the Territorial requirement for the creation of a regular school district. These schools are supplemented by schools maintained under direction of the governor out of Federal funds derived from taxes and other sources in Alaska. In the interest of efficient administration these last-mentioned schools are placed in charge of the commissioner of education of the Territory. During the last year 15 high schools and 89 elementary schools were maintained; 235 teachers were employed for 5,032 pupils, at a cost of \$541,772.09.

The Federal Government, through the Office of Education, with headquarters at Seattle, supervises the education, medical relief, industrial training, and relief of destitution among the natives in Alaska. During the year 97 schools, with an enrollment of 3,832 pupils, employed 177 teachers. Medical relief was rendered in several hospitals, by nurses at many stations, and along the Yukon River by a floating hospital. In addition to the hospitals conducted by the bureau, contracts were made with nine privately owned hospitals and sanitariums in Alaska and Seattle. Three industrial schools were maintained, and in each the program for training was improved. The floating hospital on the Yukon River serves a most useful purpose, but the present boat and equipment are not adequate for the service. A new boat should be provided. The tubercular hospital at Tanana is too small and should be enlarged. The present institution has demonstrated that a majority of the cases can be cured, and a similar hospital should be placed in southeastern Alaska.

COMMUNICATION

There are two systems of communication in the Territory, one in charge of the Signal Corps of the United States Army and one under control of the Navy. The system operated by the Signal Corps serves nearly every section of the Territory, but there are many small villages that are without communication. Some plan should be devised to provide these communities with a connection to the net

now maintained. This question has been taken up with the chief signal officer and some of the commercial companies in the hope that an efficient, easily operated radiotelegraph can be devised which will be available at a reasonable cost. The stations, five in number, operated by the Navy Department are available for commercial business, and to some extent duplicate the Signal Corps service. From a commercial standpoint these systems could be combined and no doubt operated by the Signal Corps at much less cost.

For many years recommendations have been made with a view to consolidating the law-enforcement agencies in Alaska. Exhaustive reports have been submitted, but no action has been taken. It seems unnecessary to repeat all of the statements that have been made, but there can be no question that there should be a consolidation at least of those agencies enforcing the prohibition and other criminal laws.

LEGAL INVESTIGATIONS

Under existing conditions the United States marshal must telegraph to Washington for authority to spend funds if he desires to undertake the investigation of a case which involves travel or other expenditures. In many instances this delay results in failure of the investigation. This condition could be remedied if the Department of Justice would authorize the marshal in each division to incur an expense of not to exceed \$250 without authority from the Attorney General.

REINDEER INDUSTRY

The reindeer industry was under the supervision of the Office of Education up to and including November 1, 1929, when by order of the Secretary of the Interior, dated October 3, 1929, the general supervision thereof was transferred to the Governor of Alaska. This should result in a more efficient administration of this phase of the work. Under existing laws the owners of reindeer are entitled to lease grazing areas, and the native owners should be allotted definite areas as rapidly as possible. A part of the funds that are appropriated each year are allotted for the relief of destitution among the natives, but the available funds are not at all commensurate with the absolute needs, and the amounts should be increased.

The last legislature adopted a resolution favoring the construction of an international highway that will connect Alaska and the United States. Much of the proposed highway is in British Columbia and Yukon territory. Joint action by the two Governments is necessary before the preliminary steps can be taken. The highway would be of great benefit to Alaska and Canada. Since the project is international in its scope, probably it will be necessary for the United States and Canada to appoint a joint commission and give them authority to conduct the preliminary negotiations.

RECOMMENDATIONS OF THE GOVERNOR

The Governor of Alaska makes the following recommendations: The existing laws and the treaty with Canada are not comprehensive enough to permit the Bureau of Fisheries to achieve the desired results. A survey of the waters of Bering Sea and the Pacific Ocean in the vicinity of the Aleutian Islands to determine the extent of the halibut fisheries, accompanied by recommendations for legislation designed to remedy the situation, have been submitted to both Governments. Early consideration of these reports is most essential to the industry in the Territory.

The investigation of the herring fisheries by the Bureau of Fisheries should be completed as soon as possible.

An industrial school in southeastern Alaska and hospitals for the care of tubercular natives in the first and third judicial divisions are most necessary.

Several agencies are engaged in the enforcement of the criminal laws; these should be combined and placed in the Department of Justice.

The Territory is spending \$15,000 each year in an effort to control the advance of wolves and coyotes, but the funds are not sufficient to finance an adequate program, and the Federal Government should appropriate money to assist in the work.

The revenue cutter that is stationed in southeastern Alaska during the year renders most efficient and necessary service, but it can not extend aid to the region tributary to Prince William Sound and the Alaska Peninsula. Another cutter should be assigned to those waters during the entire year.

There are two systems of communication now in the Territory. The Signal Corps of the United States Army operates the cable between Seattle and Alaska and maintains a network of wireless telegraph stations which extends to nearly every part of the Territory. This is an excellent system and it is most efficiently managed. The United States Navy maintains several wireless stations and radio-compass stations along the coast. These stations also transact commercial business. These latter stations may be necessary to naval operations and the cost of operation justified for this reason, but from an economic standpoint there seems to be no reason why they should not be placed in charge of the Signal Corps and this could be done at much less expense than under the present arrangement.

Aviation has assumed an important place in the transportation field in the Territory and Alaska occupies a strategic position on the proposed air routes between Asia and America. The United States Army should establish airports and station a squadron of planes in

the interior of the Territory and the United States Navy should provide a base for naval planes on the coast.

The aerial survey work that for two seasons has been in charge of an expedition detailed by the United States Navy has photographed practically all of southeastern Alaska. This work should be extended to include the coastal regions as far west as Unimak Island, and the expedition should be sent to Alaska each season until all of these areas have been photographed.

Many sections of the coast line and adjacent waters along the Alaska Peninsula have not been surveyed by the Coast and Geodetic Survey. Each year many more boats ply these waters, and accurate charts and aids to navigation are necessary. Early completion of this work is recommended.

The Federal buildings in Ketchikan and Fairbanks are old and entirely inadequate for present requirements. They should be replaced by fireproof structures with sufficient floor space to provide offices for all Federal activities.

For some years the Federal court has held terms at stated periods in Anchorage; the building now used for court sessions is inadequate. A new building with court room and office for the United States commissioner should be provided.

ALASKA RAILROAD

In January, 1925, an estimate was presented to Congress covering a comprehensive program of work necessary for the completion of the Alaska Railroad and for providing modern equipment throughout the system.

This program for improvement and completion of the roadbed and structure of the railroad was prosecuted continuously during the fiscal year 1929, although at times the work was slightly hampered by shortage of labor.

While snow conditions were difficult during the spring months of 1929, the total expense of removing snow, ice, and sand during the year decreased \$6,130.38, or 5.3 per cent.

The hydroelectric plant, which has been under construction at Eklutna by the Anchorage Light & Power Co., is expected to be in operation by September 1, 1929, and will reduce the expenses of the railroad through the closing of the power plant and the reduced cost of electric lighting and power at Anchorage. There will also be a reduction in revenues to the extent of the electric current heretofore sold at Anchorage by the railroad.

Since January 15, 1929, a branch office has been maintained by the railroad in Chicago, at room 219, Monadnock Building, for the

purpose of developing traffic and answering inquiries relating to tourist travel and immigration to points on the railroad.

A traveling representative of the railroad was appointed April 1, 1929, and has been engaged in furnishing information directly to individuals and groups of prospective settlers in the Northwestern States concerning the agricultural possibilities and living conditions in the farming sections along the railroad.

Passenger revenue from rail operation amounted to \$210,994.86, a decrease of \$10,372.91, or 4.7 per cent.

Rail-line revenue passengers carried were 53,177, an increase of 1,590, or 3.1 per cent. The increase was due to 1,147 more passengers carried between Fairbanks and College and 1,380 more between Anchorage and Eklutna; there was a decrease of 937 in other passengers.

The number of rail-line passengers was 62,648, an increase of 1,288, or 2.1 per cent.

Freight revenue, rail line, amounted to \$669,356.76, a decrease of \$205,941.30, or 24 per cent.

The decrease in freight revenue was due principally to the Fairbanks Exploration Co. having no construction work in the Fairbanks district. This year, however, two additional dredges have been ordered and are now en route from California to Fairbanks.

Rail-line commercial freight, exclusive of coal, amounted to 37,275 tons, a decrease of 10,561 tons, or 22 per cent.

Coal tonnage was 56,848 tons, an increase of 7,707 tons, or 16 per cent.

The increase in tonnage of coal was mainly in the amount shipped to the Fairbanks Exploration Co. for their power plant at Fairbanks.

Total commercial tonnage was 94,123 tons, a decrease of 2,854 tons, or 2.9 per cent.

Total of all tonnage, including freight for the railroad, decreased 21,257 tons, or 10.1 per cent.

Rail revenue from all sources was \$1,165,910.50, a decrease of \$189,028.94, or 14 per cent.

Passenger revenue from river-boat operation for the fiscal year amounted to \$19,556.30, an increase over the previous year of \$877.80, or 4.7 per cent.

Freight revenue from river-boat operation for the fiscal year amounted to \$52,967.07, an increase of \$321.59, or 0.6 per cent.

All revenue from river-boat operation amounted to \$100,140.66, an increase over the previous year of \$3,345.46, or 3.5 per cent.

Revenue from all sources, including nonoperating income, was \$1,269,634.07, a decrease of \$180,191.49, or 12.4 per cent.

Rail-line expenses for operation including ordinary maintenance amounted to \$2,084,673.11, a decrease of \$4,828.62, or 0.23 per cent; including replacements of bridges, operating expenses decreased \$78,004.85, or 3.5 per cent.

Operating ratio increased from 159.32 in 1928 to 179.28 in 1929.

River-boat expense was \$96,020.78, an increase of \$5,725.09, or 6.3 per cent.

Total expenses for rail and river boats were \$2,220,345.81, a decrease of \$72,279.76, or 3.2 per cent.

Deficit for rail operation was \$958,414.53, an increase of \$111,024.09 or 13.1 per cent.

The river boats were operated at a profit of \$4,119.88, as against a profit of \$6,499.51 in 1928.

Total deficit, all expenses except charges to capital account, was \$950,711.74, an increase of \$107,910.12, or 12.8 per cent.

Corresponding deficit for the year 1928, \$842,801.62.

Total deficit for all expenditures, including charges to capital account, amounted to \$1,269,561.34, an increase of \$44,020.65, or 3.6 per cent.

Transportation revenue received by the rail line amounted to \$934,559, a decrease of \$217,164.86, or 18.9 per cent.

Tourist traffic.—Tourist traffic over the road shows a steady growth, the volume thereof being greater than in past years. The indications are that a decided increase next year may be expected. Practically all of the conducted tourist parties traveling over the road stop at Mount McKinley National Park, which, together with the increased number of other tourists visiting the park, indicates that this is one of the most popular side trips to be made in the Territory.

HAWAII

The Governor of Hawaii, Hon. Lawrence M. Judd, in his annual report pays tribute to the splendid manner and the unselfish devotion displayed at all times by his predecessor, Governor Farrington, in the administration of Territorial affairs.

Attention is called to the continued prosperity of the Territory, as reflected in its exports of two principal crops, sugar and pineapples. The exports from the Territory to the mainland of the United States and foreign countries increased by \$7,975,800, reaching a total of \$119,479,835, the highest since 1921. The sugar crop for 1928 was the largest on record, approximating 900,000 tons, an increase of 10 per cent over that of the prior year. Labor conditions on the sugar plantations have been particularly good during the

year, there being no disturbances and every evidence of contented laborers and satisfied conditions.

The second largest industry, the production of pineapples, shows a large increase, the value of the pack exported during the year amounting to approximately \$40,871,581, an increase of nearly \$6,000,000 over 1927. Several of the canneries made extensive additions to their plants in an endeavor to have their production keep pace with the demand.

Coffee is produced on a commercial basis on the island of Hawaii and is in a fairly satisfactory condition; 6,000 acres are under cultivation. The value of the coffee exported during the year was \$1,368,826, the crop amounting to 5,151,266 pounds.

Imports from the United States mainland and foreign countries aggregated \$88,184,853, and the total exports amounted to \$119,479,835. The customs receipts amounted to \$2,036,681.78, a material increase over the prior year.

Prosperity is also reflected in savings-bank deposits, totaling \$35,424,194.59, of which \$2,611,507.49 is to the credit of Filipino patrons who furnish the basis of the labor supply for the sugar industry. This sum is divided into 11,862 accounts, an average of \$220.16 per depositor.

Each year shows an increase in the number of American citizens among the population. The total estimated population on June 30, 1929, was 357,649, of which 236,577 were American citizens. Of the 70,232 school children in the schools of Hawaii only 1,455 were aliens.

Local governments in Hawaii were first established on July 1, 1905, the Territory being divided into four counties. On July 1, 1909, the county comprising the island of Oahu was converted into a city and county, known as the city and county of Honolulu, with a mayor.

The other counties are Hawaii, including the island of that name; Maui, including the islands of Maui, Kahoolawe, Lanai, and all of Molokai except the leper settlement; and Kauai, including the islands of Kauai and Niihau. The leper settlement on Molokai constitutes a fifth county, Kalawao, but is under the control of the Territorial board of health.

Finances.—The income of the various counties aggregated \$11,650,687.58, as against \$13,759,719.14 for the prior year.

The assessment of property, real and personal, in the Territory, as rendered by the tax assessors, aggregated \$414,972,056, as against \$390,558,491 for the prior year.

The total revenue collected by the Territory aggregated \$11,926,631.66; total expenditures, \$10,682,110. The budget statement of general fund resources and obligations as of June 30, 1929, shows the total resources at that time to be \$2,389,512.31.

Bonded indebtedness.—The total bonded debt on June 30, 1928, was \$28,585,000, which was increased by \$1,175,000 on February 1, 1929, issue of 4½ per cent public-improvement bonds. The details are set forth in the following table:

Bonded debt June 30, 1929

Date of issue	Term of years	Rate of interest	Sale price	Percentage basis	Aggregate outstanding	Date due	Where payable, principal and interest
		<i>Per cent</i>					
Aug. 1, 1911	20-30	4	101.5875	3.88	1,500,000	Aug. 1, 1941	New York and Honolulu.
Sept. 3, 1912	20-30	4	100.5887	3.985	1,500,000	Sept. 3, 1942	Do.
Sept. 15, 1914	20-30	4	100.01	4.00	1,430,000	Sept. 15, 1944	Do.
May 15, 1916	20-30	4	100.00	4.00	1,750,000	May 15, 1946	Do.
Aug. 1, 1917	20-30	4	98.04	4.08	1,500,000	Aug. 1, 1947	Do.
Sept. 15, 1919	20-30	4½	102.814	4.377	1,500,000	Sept. 15, 1949	Do.
Sept. 15, 1920	20-30	4½	98.01	4.59	2,400,000	Sept. 15, 1950	Do.
Dec. 15, 1920	20-30	4½	98.01	4.59	200,000	Dec. 15, 1950	Do.
Dec. 31, 1920	20-30	4½	98.01	4.59	600,000	Dec. 31, 1950	Do.
June 1, 1922	20-30	4½	103.365	4.25	1,350,000	June 1, 1952	Do.
Oct. 1, 1923	20-30	4½	99.577	4.52	1,800,000	Oct. 1, 1953	Do.
Do.-----	20-30	4½	99.577	4.52	75,000	do.-----	Do.
Apr. 1, 1924	20-30	4½	99.073	4.56	2,285,000	Apr. 1, 1954	Do.
Oct. 1, 1925	20-30	4½	101.042	4.39	2,590,000	Oct. 1, 1955	Do.
May 1, 1926	20-30	4½	105.125	4.27	1,540,000	May 1, 1956	Do.
Oct. 15, 1926	20-30	4½	103.196	4.26	1,805,000	Oct. 1, 1956	Do.
Jan. 15, 1927	20-30	4½	104.82	4.18	385,000	Jan. 15, 1957	Do.
Nov. 15, 1927	20-30	4½	107.22	3.98	50,000	Nov. 15, 1957	Do.
Do.-----	Serial.	4½	106.06	3.98	2,750,000	1932-1956	Do.
May 15, 1928	Serial.	4½	102.37	4.07	1,575,000	1933-1957	Do.
Feb. 1, 1929	Serial.	4½	100.093	4.24	1,175,000	1934-1958	Do.

Total outstanding, \$29,760,000.

Bank deposits and insurance.—There were 31 banks in operation at the close of the year, distributed through various parts of the Territory. Two are national banks—one at Honolulu and one at Schofield; one is solely a savings bank, one solely commercial, and the balance are both commercial and savings. The bank deposits at the end of the year amounted to \$79,038,619.25, of which \$43,614,424.66 were commercial deposits and the remainder, \$35,424,194.59, were savings deposits. The savings accounts by races were as follows: Japanese, 23.36; Chinese, 15.11; Hawaii, 5.32; Portuguese, 10.19; Filipino, 7.37; all others, 38.65.

During the year 67 corporations were created and 62 were dissolved, as follows: Agricultural, 1 created, 1 dissolved; mercantile, 52 created, 52 dissolved; mortgage and investment, 5 created, 3 dissolved; eleemosynary, 6 created, 2 dissolved; air transportation, 3 created, none dissolved; railroad, none created, 2 dissolved; banks, none created, 1 dissolved; savings and loan, none created, 1 dissolved.

The total capitalization of domestic corporations other than eleemosynary is \$294,427,298, a decrease of \$917,800, or 0.31 per cent for the year. Foreign corporations to the number of 206 are authorized to do business in the Territory. The classes, number, and classification of the domestic corporations now in existence, incorporated before and after the transfer of sovereignty to the United States, are as follows:

Class	Number			Capital		
	Incorporated before Aug. 12, 1898	Incorporated after Aug. 12, 1898	Total	Incorporated before Aug. 12, 1898	Incorporated after Aug. 12, 1898	Total
Agricultural.....	31	63	94	\$47,080,000	\$71,940,815	\$119,020,815
Mercantile.....	31	645	676	30,095,285	103,028,838	133,124,123
Railroad.....	4	3	7	8,050,000	7,499,960	15,549,960
Street car and transportation.....		2	2		2,730,000	2,730,000
Steamship.....	1	2	3	6,500,000	206,000	6,706,000
Bank.....	1	9	10	1,100,000	2,700,000	3,800,000
Savings and loan.....		21	21		4,218,000	4,218,000
Trust.....	1	13	14	1,250,000	3,486,400	4,736,400
Mortgage and investment.....		23	23		3,590,000	3,590,000
Insurance.....		2	2		350,000	350,000
Air transportation.....		3	3		602,000	602,000
Eleemosynary.....	34	239	273			
Total.....	103	1,025	1,128	94,075,285	200,352,013	294,427,298

The fire-insurance premiums during the calendar year 1928 amounted to \$1,514,222.39 and the fire losses paid aggregated \$121,920.81. The loss for each 100 premiums was \$8.05. The marine insurance premiums amounted to \$377,665.99, and the maritime losses amounted to \$24,942.41. Life insurance written was valued at \$18,723,344.00, and the premiums paid thereon aggregated \$561,870.26, the renewal premiums \$3,330,459.44, and the losses paid amounted to \$832,216.01.

Public lands.—The public lands of the Territory of Hawaii comprise all the remaining portions of the lands which previous to August 15, 1895, were known as "Government lands" and "Crown lands" and any other lands which have been acquired by the Government in any manner since that date. These lands are administered by the commissioner of public lands under the provisions of section 73 of the Hawaiian organic act, as amended, and include an estimated total area of 1,592,330 acres, classified as follows:

	Acres
Agricultural lands.....	70,385
Cane lands.....	28,000
Other agricultural lands.....	40,585
Rice lands.....	1,800
Pasture lands.....	621,406
Homestead lands (unpatented).....	31,176
Town lots.....	675
Fishponds.....	350
Reservations.....	33,210
Forest reservations.....	626,049
Waste lands.....	209,079
Total area.....	1,592,330

These lands may be homesteaded, sold, leased, or exchanged in accordance with the provisions of the land laws. Land for homesteading, when first opened up, is allotted by drawing, and there-

after upon application. Land for home or business sites is sold at public auction. The area of a residence lot may not exceed 3 acres, but the area of a business site may be as large as is necessary for the economic conduct of the particular business. The sale of all Territorial lands is restricted to citizens of the United States or corporations doing business in the Territory of Hawaii.

Land-patent grants.—Two hundred and five land-patent grants were issued, covering a total area of 1,617.801, valued at \$117,858.79; 58 were issued on homesteads, covering a total area of 1,454.43 acres, valued at \$37,644.15; 147 were issued on cash purchases, preference rights, land exchanges, and sales on time-payment agreements, involving a total area of 163.371 acres, valued at \$80,214.64. Twenty land patents were issued confirming 20 land commission awards, covering a total area of 9,770.805 acres; 14, covering a total area of 9,755.118 acres, were in fee simple; 6, covering a total area of 15.687 acres, carried a Government commutation of \$195.84.

The population of Hawaii on January 1, 1920, as shown by the Fourteenth Census of the United States, was 255,912. Compared with a population of 191,909 in 1910, this shows an increase during the 10 years of 64,003, or 33.4 per cent. The population of the Territory was estimated by the board of health to be 357,649 on June 30, 1929, an increase of 101,737 in the nine and one-half years since the Federal census.

The following table shows the estimated number of citizens under each racial group as well as the number of foreigners of various nationalities, and is based primarily on the Federal census of 1920, with births, deaths, passenger arrivals, departures, and naturalization certificates issued since that date:

Estimated population of the Territory of Hawaii, showing increase of American citizens since 1920

Racial ancestry	1920 ¹			1925			1929		
	Ameri- can citi- zens	Aliens	Total	Ameri- can citi- zens	Aliens	Total	Ameri- can citi- zens	Aliens	Total
American.....	17,853	2,166	20,019	18,426	360	18,786	37,165	841	38,006
British.....									
German.....									
Russian.....									
Hawaiian.....									
Hawaiian.....	23,723	-----	23,723	21,145	-----	21,145	20,479	-----	20,479
Asiatic-Hawaiian.....	6,955	-----	6,955	8,345	-----	8,345	10,598	-----	10,598
Caucasian-Hawaiian.....	11,072	-----	11,072	13,837	-----	13,837	16,687	-----	16,687
Portuguese.....	22,346	4,656	27,002	23,918	3,552	27,470	26,933	2,784	29,717
Porto Rican.....	5,602	-----	5,602	6,382	-----	6,382	6,923	-----	6,923
Spanish.....	1,145	1,285	2,430	1,147	799	1,946	1,217	634	1,851
Japanese.....	49,016	60,258	109,274	70,860	57,208	128,068	87,748	49,659	137,407
Chinese.....	12,728	10,779	23,507	13,075	11,776	24,851	15,625	9,586	25,211
Filipino.....	(²)	21,031	21,031	4,800	² 44,535	49,335	9,176	54,693	63,869
Korean.....	1,518	3,432	4,950	2,916	3,040	5,956	3,643	2,750	6,393
All others.....	248	99	347	220	210	430	383	125	508
Total.....	152,206	103,706	255,912	185,071	121,480	306,551	236,577	121,072	357,649

¹ 1920, Bureau of Census compilation; board of health first compiled citizenship figures in 1924.

² Owe allegiance to the United States.

The school year 1928-29 has been one of steady growth and constructive progress for the public schools of the Territory of Hawaii. The enrollment has increased approximately 7 per cent, from 66,434 in June, 1928, to 70,232 in June, 1929, and the teaching staff from 2,298 to 2,485.

Vocational education in the public schools of Hawaii deals with three main groups of occupations—agriculture, trades and industries, and home making. From the standpoint of the number of people engaged, home making is the most important single occupation in the Territory, but from a business standpoint agriculture comes first.

The following is a comparative table by racial descent of pupils attending all public schools in the Territory during the year:

Racial descent	Number of public-school pupils	Per cent of total	Racial descent	Number of public-school pupils	Per cent of total
Hawaiian.....	3,376	4.81	Japanese.....	37,112	52.84
Part Hawaiian.....	7,446	10.60	Korean.....	1,590	2.27
Portuguese.....	6,093	8.68	Filipino.....	3,026	4.31
Porto Rican.....	1,097	1.56	All others.....	698	.99
Spanish.....	248	.35			
Other Caucasian.....	3,001	4.27	Total.....	70,232	100.00
Chinese.....	6,545	9.32			

The following is the classification of pupils by birthplace:

	Hawaii	Maui	Oahu	Kauai	Male	Female	Total	Per cent of total
Born in United States.....	15,199	9,849	37,191	6,538	35,275	33,502	68,777	97.93
Foreign born.....	177	208	882	188	873	582	1,455	2.07
Total.....	15,376	10,057	38,073	6,726	36,148	34,084	70,232	100.00

Health conditions were not so favorable during the past year as in previous years, the birth rate being slightly lower, the death rate higher, and an appreciable increase in infant mortality and several of the communicable diseases being noted. Typhoid and tuberculosis showed outstanding decreases. There is much work to be done in the reduction of infant mortality, particularly along the lines of better education of mothers, attendance at health centers by physicians, registration and licensing of midwives, and the hospital care of expectant mothers.

Satisfactory progress was made in the medical inspection of the schools, a total of 42,699 children being examined in the public, 3,639 in the kindergarten and private schools, while 6,812 children were vaccinated in the public schools and 1,377 in the kindergarten and private schools.

The number of licensed physicians and surgeons practicing in Hawaii aggregated 197.

Territorial hospital for insane.—An institution for the insane was opened in 1864. The hospital plant, including the new plant at Kaneohe, is valued at \$526,880.63; total acreage of hospital property owned, 167 acres, of which 29 acres is under cultivation; total acreage cleared during year at Kaneohe, 10 acres, net per capita cost, \$1.0386; number of officers and employees, 71. The population during the year aggregated 583 persons, 402 of whom were male and 181 female.

One of the outstanding events of the year was the celebration in August, 1928, commemorating the one hundred and fiftieth anniversary of the discovery of the Hawaiian Islands by Capt. James Cook, R. N. The President of the United States was authorized and requested by Congress to formally invite the Government of Great Britain to participate in the celebration by sending a man-of-war with delegates representing the Dominions most interested. Three men-of-war of His Majesty's Navy, and delegates representing the Governments of Great Britain, Australia, and New Zealand, respectively, took part in the ceremonies. The Dominion of Canada also sent a delegate. The President of the United States was represented by Hon. Dwight F. Davis, then Secretary of War. Appropriate ceremonies fittingly observed the occasion in various parts of the islands, and paid tribute to the great discoverer and leader, Capt. James Cook, R. N.



ELEEMOSYNARY INSTITUTIONS

ST. ELIZABETHS HOSPITAL

St. Elizabeths Hospital, which is recognized by the American Medical Association as a class A institution, is devoted to the treatment of insane patients of the Army, Navy, and civilian employees, including those in the quartermaster pay class of the Army, the Navy, the Marine Corps, the Public Health Service, members of the Coast Guard, Veterans' Bureau beneficiaries, and members of the foreign legions or participants in recent wars in the ranks of foreign allies, under reciprocal arrangements; insane residents of the District of Columbia, United States prisoners before and after conviction, inmates of the National Home for Disabled Volunteer Soldiers and of the Soldiers' Home, Washington, D. C., insane American citizens in the Canal Zone whose residence in the United States can not be ascertained, interned persons and prisoners of war under the jurisdiction of the Navy and War Departments, respectively, American citizens who have been legally adjudged insane in the Dominion of Canada, and beneficiaries of the United States Employees' Compensation Commission.

On June 30, 1929, there were 4,331 patients remaining in the hospital. The total number of patients under treatment during the year was 4,899. The total number of discharges, including deaths, was 568. The daily average population was 4,202, an increase of 188 over the preceding year. The total number of deaths was 252, as compared with 189 for the previous year.

Movement of patient population, fiscal year 1929

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1928.....	2, 245	591	2, 836	802	505	1, 307	4, 143
Admitted during year ended June 30, 1929.....	474	111	585	110	61	171	756
Total number under care and treatment during year ended June 30, 1929.....	2, 719	702	3, 421	912	566	1, 478	4, 899
Discharged as—							
Recovered.....	75	3	78	16	6	22	100
Improved.....	99	6	105	10	2	12	117
Unimproved.....	63	2	65	11	0	11	76
Not insane.....	19	1	20	0	3	3	23
Total discharged.....	256	12	268	37	11	48	316
Died.....	101	48	149	65	38	103	252
Total of patients discharged and dead.....	357	60	417	102	49	151	568
Number of patients remaining June 30, 1929.....	2, 362	642	3, 004	810	517	1, 327	4, 331

During the year the number of admissions of persons for the first time was 661, of which 513 were men and 148 women. Of the total number admitted 550 were citizens by birth, 68 were citizens by naturalization, 27 aliens, and 16 whose citizenship was unascertained. According to race, 157 were African (black), 1 American Indian, 8 English, 2 French, 15 German, 2 Greek, 8 Hebrew, 3 Irish, 6 Italian, 9 Mexican, 4 Pacific Islanders, 1 Portuguese, 1 Rumanian, 12 Scandinavian, 1 Slavonic, 3 Spanish, 1 Welsh, and 10 race unascertained. The races above mentioned show 17 different classes.

The outstanding event of importance at the hospital was the letting of a contract for the construction of a medical and surgical hospital. This building will provide for 200 beds for the treatment of acute medical and surgical conditions. Its construction has already been started, and in accordance with the terms of the contract the final date for its completion is July 25, 1930. The building equipped and running will in every way be a modern medical and surgical hospital, and as such marks a distinct advance in the equipment of hospitals for the care of the mentally deficient.

Other events of importance on the physical side of the institution were the purchase of a triple combination pumping engine for fire protection capable of pumping several streams of water over the highest buildings on the reservation and the engaging of three full-time firemen in connection with the service; the purchase of a new, up-to-date ambulance with a carrier which will permit the carrying of patients in comfort to and from the operating room and the various clinics, as well as the hospital building; and a complete survey of the power house and equipment, upon which will be based a plan for the future development of a heating and lighting power plant for the institution.

The total number of employees in the hospital on June 30, 1929, was 1,298, an increase of 27 over the prior year. There were 338 appointments and 311 separations during the year. The personnel turnover of the permanent employees has been materially decreased. At the same time the hospital has secured a higher type of employee because of the keen competition which exists at the institution. Nearly a thousand letters were received during the month of June from applicants for training in the hospital school.

The Red Cross unit continues to function in a most valuable way for the welfare of the patients. It is particularly helpful in the hospital in making contacts with the relatives and friends of patients who live outside of the District of Columbia, in assisting follow-up work of discharged patients who are not in the District, assisting patients in the preparation of pension claims, tracing of lost relatives, lost property, assisting relatives and friends who are visiting,

and in many other ways being of general usefulness in the matter of the relationship of the patient to the hospital.

Particular events of the medical service have been the continuation of the successful treatment of paresis by malarial inoculation; the continuation of the work of improving the condition of chronic patients in the back wards; and, in cooperation with certain members of the staff of Johns Hopkins University, the inauguration of a treatment of carcinoma by a new method which, in the very limited time that it has been in operation, has seemed to show encouraging results.

The most important single need of the hospital is additional beds. The hospital is not only in a very crowded condition but the population is increasing very rapidly, the lowest estimate being that it is overcrowded by more than 500 patients. To relieve the situation it has been planned to provide for a 1,600-bed extension to the hospital, of which the medical and surgical building constitutes the first 200 beds. Included in the estimate for the coming year is an item for the addition of 740 beds, which will comprise a receiving building for men, a receiving building for women, and a tuberculosis building; also an item for necessary additions to the power, heat, and lighting plant.

The training school had 11 graduates this year—2 nurses and 9 psychiatric aides. Also 49 attendants successfully completed the three months' course required of them. The affiliated course in psychiatric nursing was continued for students of the Army School of Nursing, Sibley Memorial Hospital, Homeopathic Hospital, Emergency Hospital, and George Washington University Hospital School of Nursing. The hospital had affiliations for its student nurses with Children's Hospital, Sibley Memorial Hospital, Emergency Hospital, Episcopal Eye, Ear, Nose, and Throat Hospital, and arrangements are completed for affiliation with the Instructive Visiting Nurses Society.

The hospital continues to emphasize the need for a complete revision of the lunacy legislation in the District of Columbia. In discussing this matter the superintendent states that—

On February 7, 1927, the Secretary of the Interior transmitted to the chairman of the Committee on the District of Columbia, House of Representatives, bills changing the method of admissions to St. Elizabeths Hospital. These bills were introduced in Congress, and bore the numbers H. R. 17045 and H. R. 17137 of the second session of the Sixty-ninth Congress. The main changes of the existing legislation were:

Provision for voluntary commitment for treatment, on request of patients, with provision for discharge on three days' notice.

Provision that insane taken into custody by the police or other officials shall not be subjected to trials as are criminals, but may be held in the hospital

and treated, and not tried except upon their requests or that of their relatives, guardians, or friends.

If a trial is demanded by an insane person, his guardian, or friends, or by court, upon petition, the insane person shall be heard by the court, and not subjected to trial by jury unless the insane person, his relatives, guardian, or friends demand it.

Temporary commitment or detention is provided for, with provision that during such temporary commitment, and prior to formal commitment, the person may be released upon certificate to the District of Columbia by the superintendent of the hospital or by two physicians in regular attendance at any other hospital that the person is not insane or has recovered his or her reason.

Provision for the automatic restoration of civil rights of patients discharged from the hospital on certificate of the superintendent that they are cured or that further treatment is unnecessary or undesirable.

The proposed legislation recommended, it is believed, would make unnecessary so many writs of habeas corpus, and would make the release of patients to those competent to care for them simpler.

The proposed legislation would be in keeping with previous attempts to secure legislation amendatory of those portions of the District Code which deal with admissions, detention, and release of patients in the Government Hospital for the Insane (St. Elizabeths Hospital).

In the report of the Comptroller General of the United States (H. Doc. 605, 69th Cong., 2d sess.), suggestion is made that additional legislation on this subject is desirable.

A committee of medical advisers which made a survey of the hospital under the direction of the Secretary of the Interior made a number of recommendations for remedial legislation, but did not undertake to draft a measure for this purpose.

The design of the bill suggested was to provide a method more in keeping with the modern humanitarian and medical attitude toward this class of patients, and along lines which have proved effective in several of the States and in other countries.

Since the original of this proposed act was drafted, new ideas have arisen which we believe should be incorporated, such as that some provision should be made for emergency commitment.

At the present time, we understand, there is a committee appointed by the District Commissioners, or the Public Welfare Board of the District of Columbia, which is preparing a draft of a bill to replace the District Code for the admission of mental cases. The proposed bill by the committee from the District would not affect the commitment to a hospital of that class of persons certified by heads of departments and establishments under existing law. The committee probably will not take any action on the second bill that was introduced in the House of Representatives proposing to regulate the commitment to and discharge from St. Elizabeths Hospital of persons certified by heads of departments and establishments under certain existing laws. This proposed law should receive consideration irrespective of what action is taken by the committee mentioned.

Every effort should be made to secure modification of the present laws governing admissions to St. Elizabeths Hospital.

In 1924 a Royal Commission on Lunacy and Mental Disorder was appointed to inquire, as regards England and Wales, into the existing law and administrative machinery in connection with the certification, detention, and care of

persons who are, or are alleged to be, of unsound mind, etc. They made their report, and in commenting on it a London correspondent says:

"Every facility should be afforded to the mentally ailing to submit voluntarily to treatment; but when compulsory detention is unavoidable, the intervention of the law should be as unobtrusive as possible."

This, we think, expresses the objective which should be sought.

FREEDMEN'S HOSPITAL

Freedmen's Hospital and Asylum was established as such under the War Department by the act of March 3, 1871 (16 Stat. 506), and subsequently transferred to the Interior Department by the act of June 23, 1874 (18 Stat. 223). Prior to 1871 the hospital was under the control of the War Department as an adjunct of the Freedmen's Bureau, which was established approximately 64 years ago, principally for the care of the refugees who came to Washington in large numbers following the close of the Civil War.

The activities of the hospital in recent years have enormously expanded owing to the ever-growing requirements for the care of the sick and injured, with a consequent increase in the cost of operation year by year. The need of a modern obstetrical ward still exists; its urgency is more pressing year by year as the difficulties increase with the efforts to maintain a modern maternity service with inadequate facilities housed in a ward originally designed for general medical cases. The floor space is poorly adapted for the care of such cases, on account of which the necessary equipment can not be installed to advantage or placed in accordance with the best ideas suggested by modern methods. The release of the ward now used for this work will afford the necessary increase of pediatric patients, which must be forthcoming, not only for teaching purposes but in order to meet the requirements of the State nursing boards of registration.

The various clinics conducted in the out-patient department are poorly, improperly, and inadequately housed. During the preceding fiscal year 25,272 patients were treated in this department in small rooms, badly appointed, lacking the necessary complementary laboratory facilities. The medical students of Howard University are dependent solely on this hospital for clinic material, which under existing conditions can not be satisfactorily developed, both from the standpoint of the patients and the needs of the medical school as a teaching asset. Moreover, a clinic building would effect a distinct saving, in that many patients could be treated without the necessity of having them admitted into the hospital. This building would also permit the development of a real physical therapy department. This service is now attempted in a limited way in unsuited quarters and, of course, is unsatisfactory.

A new ambulance is required, the present vehicle having been in use more than six years and requiring considerable expenditure for its upkeep. Two technicians are also required, one to operate the electrocardiograph and the basal metabolism instruments and one to assist in the pathological and bacteriological laboratories, where at present many valuable investigations are delayed and some eliminated on account of a lack of personnel. An additional clerk, a cook, and several laborers are also required to meet the growing needs of the institution.

The school of nursing has made marked progress during the last year. The quality of service rendered the patients by the nurses has much improved. There were graduated May 31, 1929, in the Andrew Rankin Memorial Chapel at Howard University, 32 nurses, making a total of 482 graduates holding diplomas from the school.

Receipts and disbursements, 1929

Receipts:

Appropriation, Interior act—

Salaries	\$142,000.00
For support	80,500.00
For remodeling and enlarging buildings	252,000.00
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	474,500.00
Second deficiency act	18,000.00
From pay patients	26,288.75
From Howard University	31,084.83
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Total	549,873.58
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Disbursements:

Miscellaneous (fuel, light, clothing, medicine, etc.)	63,110.07
From pay patients	11,057.04
Subsistence	47,528.44
From pay patients	13,185.90
Salaries	159,647.54
Remodeling and enlarging buildings	219,099.51
Refunds, pay patients	875.00
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Total	514,639.06
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Unexpended balances:

Miscellaneous	474.76
Subsistence	471.56
Salaries	352.46
Pay patients	1,170.81
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Total	2,469.59
Remodeling and enlarging buildings (available for expenditure during 1930)	32,900.49
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Total, unexpended balances	35,370.08

HOWARD UNIVERSITY

The Howard University was incorporated by the act of March 2, 1867 (14 Stat. 438). The object of the incorporation named in the first section of the act was "for the education of youth in liberal arts and sciences." It is declared that the incorporators shall be "a body politic and corporate with perpetual succession." The management and control of the institution is vested in a board of not less than 13 trustees; the full board, however, consists of 24 trustees.

Section 8 of the act providing for the incorporation of Howard University, above mentioned, was by act of Congress approved December 13, 1928 (45 Stat. 1021), amended to read as follows:

SEC. 8. Annual appropriations are hereby authorized to aid in the construction, development, improvement, and maintenance of the university, no part of which shall be used for religious instruction. The university shall, at all times, be open to inspection by the Bureau of Education and shall be inspected by said bureau at least once each year. An annual report, making a full exhibit of the affairs of the university, shall be presented to Congress each year in the report of the Bureau of Education.

Students.—The total enrollment of the university for the year 1928-29 was 2,671 students from 38 States (including the District of Columbia) and 15 foreign countries. At the June commencement 277 men and women received degrees in nine schools and colleges. Five of these received the graduate degree of master of arts.

School of medicine.—Three hundred and sixty students enrolled in the school of medicine. In the college of medicine, 235; college of dentistry, 69; college of pharmacy, 56. There were 287 applicants for admission to the school of medicine. This number far exceeded the school's capacity. Those of maximum preparation were selected. There is a notable increase in the caliber of entering students. Of the 60 students entering the school of medicine this year, 30 held bachelor degrees and 28 had done three years of college work. Among the 20 entering dentistry 6 held degrees, 8 had done three years of college work and 3 had done two years of college work. Of the 25 students entering pharmacy, 2 had done three years of college work. During the 5-year period from 1923 to 1928 an average of 230 students per year have enrolled in the Howard University School of Medicine and an average of 55 have graduated. This school has received an appropriation of \$82,000 from the General Education Board, by far the larger portion of which is to be devoted to the training of men of distinguished ability for full-time positions in the preclinical laboratories. The dental college has received this year a gift of \$2,000 from the Carnegie Foundation

for the development of the dental library. Degrees were conferred as follows: M. D., 42; D. D. S., 19; Ph. C., 12.

School of law.—The most notable development in the professional schools this year has been the inauguration of a full-time 3-year day school of law with 20 students registered in the first-year class. Nine students have registered also for the first-year class in a new 4-year part-time evening school. The development of the law library under the grant of \$20,000 from the Laura Spelman fund has been very satisfactory. With the employment of an additional full-time professor at the beginning of the year 1929-30 the school will be fully prepared to meet the formal requirements for entrance into the American Association of Law Schools. Seventy-five students were registered in the school of law this year from 15 States, the District of Columbia, and the British West Indies. The degree of LL. B. was conferred upon 27 graduates.

Academic colleges.—The academic colleges enrolled 1,919 students. This exceeded the enrollment of last year by 132 and is the largest enrollment in the history of Howard University. There were 666 new students.

College of liberal arts.—The department of zoology in that college under the leadership of Dr. E. E. Just has received an appropriation of \$80,000 from the Julius Rosenwald fund for the development of graduate work in research over a period of five years. The General Education Board has appropriated the sum of \$80,000 to be used over a period of four years for raising the salaries of teachers in the undergraduate colleges. This sum was given in anticipation of a raise of \$10 per year in student fees over a period of three years. The university has received generous help from the Julius Rosenwald fund and the General Education Board during the current year toward scholarships for ambitious and underpaid teachers who desire to pursue further study. The General Education Board has recently made available the sum of \$29,000 for the further training of teachers in the departments of mathematics and the natural sciences. The same board has made a grant of \$28,000 toward the development of the libraries of these departments. This sum contributes toward a total of \$60,000 made available from private sources for the libraries of the university during the 2-year period 1927-1929. The total enrollment was 934, and there were 71 graduates, as follows: Bachelor of arts, 35; bachelor of sciences, 35; bachelor of sciences in commerce, 1.

College of education.—The enrollment for the year in the college of education was 836, as compared with 741 for the last year and 652 for the year before. This was a gain of 22 per cent within two years. The dean of this college has been elected to the presidency

of the Association of Negro Colleges and has worked effectively during the year toward the establishment of a procedure whereby the Negro colleges of the southern area may be rated through the agency of the Association of Colleges and Secondary Schools of the Southern States. Another member of the university faculty has been elected to the presidency of the National Association of Teachers in Colored Schools. The total enrollment in the college of education was 741, and 93 degrees were awarded, as follows: Bachelor of arts in education, 80; bachelor of sciences in education, 13.

College of applied science.—Ninety-one students enrolled for work in this college. Courses were offered in architecture, art, civil engineering, electrical and mechanical engineering, and home economics. Six degrees were awarded, as follows: Bachelor of sciences in civil engineering, 2; bachelor of sciences in electrical engineering, 2; bachelor of sciences in home economics, 2.

School of music.—Fifty-eight students were enrolled for courses in the school of music this year and 22 additional special students were registered. One student was graduated with the degree of bachelor of music. An additional teacher was obtained and courses in public-school music established.

Graduate school.—During the year there were 63 graduates in residence, distributed as follows: Liberal arts, 38; education, 22; music, 3. Five graduate degrees were awarded, as follows: M. A. in education, 1; M. A. in German, 1; M. A. in history, 2; M. A. in mathematics, 2. Twelve graduate fellows have been appointed for the year 1929-30, as follows: 5 in education, 2 in English, 2 in history, 2 in mathematics, and 1 in psychology. The demand for graduate work increases.

Department of physical education.—The department of physical education is now organized under the college of liberal arts. During the year it served an average of 494 men and 277 women each quarter. A professional course for the preparation of teachers in physical education, covering a curriculum of four years, was inaugurated during the year with an enrollment of 51 students.

Reserve Officers' Training Corps.—The professor of military science and tactics reports an enrollment of 373 students in the autumn quarter, 398 in the winter quarter, and 331 in the spring quarter. Twenty-three students were awarded commissions as second lieutenants of Infantry, Officers' Reserve Corps, and five students under 21 years of age were awarded certificates of eligibility.

Evening classes and summer session.—The university rendered a substantial educational service in the extension work of its evening classes. These classes enrolled a total of 668 students during the year, 369 of whom were teachers, 89 were Government employees,

and 210 were in private employment. The summer school enrolled 406 students from 26 States and 2 foreign countries. Fifteen students met the requirements for graduation at the completion of the summer session—nine in the college of education and six in the college of liberal arts.

Finances.—Howard University was incorporated in 1867, but no appropriation was made for its support by Congress until March 3, 1879, when the sum of \$10,000 was appropriated for maintenance. Since that time Congress has made annual appropriations for the institution, expendable under the supervision of the Secretary of the Interior, who is patron ex officio of the board of trustees. The president of the institution reports total appropriations to Howard University by private philanthropy during the year of \$905,000, in varying amounts for graduate work and research, increases in salary, scholarships for the training of teachers in medicine, scholarships for the training of teachers in the natural sciences, books for the natural sciences and for the dental library, graduate scholarships, and for physical plant extensions.

Property.—The report of the secretary-treasurer covers receipts from all sources, including the Federal appropriations, tuition and other fees, endowments and other investments, rents, donations, etc. The total income for 1929 from all sources was \$588,903.65, and the expenditures were \$561,373.34. For the third consecutive time there is no current deficit. On the contrary, economical administration has secured a sum of \$27,530.31, to be applied toward retiring the accumulated deficit. The total assets on June 30, 1928, were \$3,931,068.51. Of this sum the land, buildings, and equipment were valued at \$2,635,896.83; \$845,572.94 of trust funds were invested in mortgages and other securities. The balances consisted of \$102,429.98 assets of general fund, \$60,585.51 unproductive land, \$5,867.62 cash in bank, and \$280,715.23 unexpended balance of the appropriation from Congress for the women's dormitory and chemistry buildings. The property of the university has been accumulated mainly through donations and the sale of and the increase in value of 128 acres of land originally purchased and subdivided by it. The annual congressional appropriation was made for the payment of salaries, purchase of supplies, care of grounds, and for other expenses.

COLUMBIA INSTITUTION FOR THE DEAF

This institution was established by act of February 16, 1857 (11 Stats. 161). It is managed by a board of directors, on which Congress is represented by one Senator and two Representatives, and is supported mainly by congressional appropriation and in part by tuition fees, etc. The admission of all beneficiaries to the institution

is subject to the approval of the Secretary of the Interior, and the latter was, up to and including June 30, 1898, charged with the supervision of the expenditure of congressional appropriations. The sundry civil appropriation act, however, which was approved July 1, 1898, transferred to the directors of the institution the control of all disbursements of moneys appropriated by Congress for its benefit, their accounts to be settled and adjusted at the Treasury Department.

During the year ended June 30, 1929, there were under instruction in the advanced department of the institution, known as Gallaudet College, 75 men and 54 women, a total of 129, representing 35 States and the District of Columbia and Canada. In the grammar department, known as Kendall School, 59 were under instruction, 36 being boys and 23 girls. Of the total number in this department 54 were beneficiaries of the District of Columbia.

The health of the students during the year was uniformly good. The usual care was taken of the dairy to see that the milk supply was good.

The course of instruction remained practically unchanged during the year. At the Convention of American Instructors of the Deaf held at Faribault, Minn., in June the institution was urged to provide more vocational courses and to enlarge its normal training department. At its meeting held in Washington in February, 1929, a special committee on problems of the deaf, appointed by the National Research Council, reported on the subject very fully. The report of the committee was adopted with modifications and a permanent committee appointed to carry out the program. This research calls for an investigation of the curricula of schools for the deaf, training of special teachers of the deaf, preparation of adequate speech, lip reading, intelligence, and educational tests for deaf pupils, as well as discrimination against deaf people in law, employment, and other important problems. At the meeting of the Convention of American Instructors of the Deaf held at Faribault, Minn., from June 17 to June 22, two members of the faculty attended and were active on the program. Sixty graduates of the various departments of the institution now engaged in the education of the deaf were present at this meeting, 18 of whom are executive heads of schools for the deaf.

Enlargement of the vocational training work in the institution is urgently requested by the heads of schools for the deaf and teachers of the deaf throughout the country. To provide for this and better auricular and oral instruction three new instructors are required. A new building to house vocational work and classrooms is needed to make more room for college students and to house properly teaching activities. An increase of 25 free scholarships in the advanced department is needed to take care of the expected increased attendance.

During the year the power plant was remodeled and a 300-horse-power steam boiler installed and put in operation. Additional space for coal storage was provided and new refrigeration installed in the main kitchen, and approximately 600 square yards of old asphalt roadway was replaced by new asphalt.

On commencement day 1 honorary degree, 4 degrees of master of arts in the course of the normal department, 2 certificates of graduation from that department, 3 degrees of bachelor of science, and 8 degrees of bachelor of arts were conferred.

The cash on hand on July 1, 1928, was \$534.45; the receipts during the year were \$169,332.83, or a grand total of \$169,867.28. The total expenditures during the year were \$167,135.57, leaving a balance on hand June 30, 1929, of \$731.71.

EXTRA-DEPARTMENTAL ACTIVITIES

AMERICAN ANTIQUITIES

The act of June 8, 1906, entitled "An act for the preservation of American antiquities," provides, among other things:

SEC. 3. That permits for the examination of ruins, the excavation of archeological sites, and the gathering of objects of antiquity upon the lands under their respective jurisdiction may be granted by the Secretaries of the Interior, Agriculture, and War to institutions which they may deem properly qualified to conduct such examination, excavation, or gathering, subject to such rules and regulations as they may prescribe: *Provided*, That the examinations, excavations and gatherings are undertaken for the benefit of reputable museums, universities, colleges, or other recognized scientific or educational institutions, with a view to increasing the knowledge of such objects, and that the gatherings shall be made for permanent preservation in public museums.

SEC. 4. That the secretaries of the departments aforesaid shall make and publish from time to time uniform rules and regulations for the purpose of carrying out the provisions of this act.

Archeological explorations.—The uniform rules and regulations promulgated by the Secretaries of the Interior, Agriculture, and War, pursuant to the above-mentioned act, under date of December 28, 1906, provides (par. 3) that—

Permits for the excavation of ruins, the excavation of archeological sites, and the gathering of objects of antiquity will be granted by the respective secretaries having jurisdiction to reputable museums, universities, colleges, or other recognized scientific or educational institutions, or to their duly authorized agents.

Under the provisions of the above act, the department archeologist, Mr. Jesse L. Nusbaum, who is also superintendent of the Mesa Verde National Park, renders advisory service to all branches of the department, as well as to scientific and educational institutions contemplating archeological investigation upon the public domain under the jurisdiction of the department. This official is also engaged in developing methods for the better protection of the many archeological sites located mainly throughout the Southwest; the prevention of unlawful excavation of these sites; the orderly conduct of work authorized by department permits, and the proper publication of the scientific information derived therefrom.

Permits granted.—During the year 16 permits were granted for the examination, excavation, and gathering of specimens, as follows:

July 27, 1928, Dr. Byron Cummings, president, University of Arizona, Tucson, Ariz., was granted an extension for one year of

prior permit to conduct an archæological reconnaissance and excavate in the San Juan drainage and on the Gila drainage on the San Carlos Reservation, Ariz., including permission to excavate a small pueblo ruin in township 21, section 34, 7½ miles east of Flagstaff, Ariz.

July 31, 1928, permission was granted the Museum of the American Indian, Heye Foundation, New York City, to conduct minor final excavations at the ruins of Hawikuk, on the Zuni Indian Reservation, New Mexico, in completion of work inaugurated under the department permit of 1923.

August 1, 1928, the University of Colorado, Boulder, Colo., was authorized to conduct, under the supervision of its representative, Mr. Earl H. Morris, a reconnaissance in the Hopi Indian Reservation, Ariz., south of the thirty-sixth parallel, and extending eastward from the west boundary of Navajo County to the Keams Canyon Agency; also to excavate and collect specimens in the ruins of Kawaikuh, 7 miles from Jeddito.

September 28, 1928, President George Thomas, University of Utah, Salt Lake City, Utah, was authorized to excavate two small burial mounds in Ute Canyon, 12 miles southwest of Blanding, Utah, under the direction of the department of anthropology of that university. However, unlicensed pothunters, probably of the adjacent region, completely destroyed these two sites, from a scientific standpoint, prior to the arrival of the university expedition in October, 1928.

December 13, 1928, Mr. Harold S. Gladwin, the Medallion, Pasadena, Calif., was granted permission, June 30, 1929, to make surface collections of potsherds on ruins, rubbish mounds, etc., without excavation, on the public lands under the jurisdiction of the Interior Department in the southwestern section of the United States, except on Indian reservations.

January 19, 1929, Mr. M. R. Harrington, director of research, Southwest Museum, Los Angeles, Calif., was authorized to conduct, during 1929, an archæological reconnaissance on behalf of the Southwest Museum on such lands as are under the jurisdiction of the Department of Interior in Nye, Clark, and Lincoln Counties, Nev., and San Bernardino County, Calif., for the purpose of tracing the western limits of the pueblo and basket-maker culture areas and their relations with the cultures of California.

February 21, 1929, Dr. C. G. Abbot, Secretary of the Smithsonian Institution, Washington, D. C., was granted permission on behalf of the Peabody Museum of Natural History, Yale University, and the Smithsonian Institution, to jointly conduct paleontological excavations within certain areas of Dona Ana County, N. Mex., during the year 1929.

April 19, 1929, Dr. C. G. Abbot, Secretary, Smithsonian Institution, was granted authority for Mr. C. W. Gilmore, curator of vertebrate paleontology, National Museum, to conduct an archæological exploration, excavate, and collect paleontological material within the entire east half of the Navajo Reservation between the San Juan River on the north and the Chaco River on the south, during 1929.

April 20, 1929, Dr. Gilbert Grosvenor, president, National Geographic Society, Washington, D. C., was granted permission to conduct, during 1929, under the direction of Mr. Neil M. Judd, curator of archæology, United States National Museum, such archæological excavations as may be necessary, following certain superficial inspections, in 10 designated ruins in the Hopi, Navajo, and Fort Apache Indian Reservations, and Navajo County, Ariz., for the purpose of obtaining, if possible, charred fragments of beams or logs cut prior to 1260 A. D., to close the single remaining gap in the "tree ring" chronology now being erected by the University of Arizona.

May 10, 1929, Dr. Edgar L. Hewitt, director, School of American Research, Santa Fe, N. Mex., was authorized on behalf of the School of American Research and the University of New Mexico to jointly continue excavations at the ruin of Chettro Ketl, Chaco Canyon National Monument, San Juan County, N. Mex., for a period of three years, subject to certain restrictive conditions.

May 20, 1929, Edward Reynolds, M. D., director, Peabody Museum of American Archæology and Ethnology, Harvard University, Cambridge, Mass., was granted permission during 1929 to conduct, under the direction of Mr. Henry B. Roberts, exploratory archæological investigations in southern Utah northwest of the Colorado River in the drainage of the Escalante, Fremont, Muddy, and Paria Rivers, including the adjacent corners of Sevier and Emery Counties, Utah; also in the drainage of the Green and Colorado Rivers in Emery and Grand Counties, Utah, and in the portion of San Juan County, Utah, northwest of the Colorado River.

May 31, 1929, the director, Royal Ontario Museum of Paleontology, Toronto, Canada, was granted permission to continue during 1929, the collection of vertebrate fossils in South Dakota and Wyoming commenced in 1928, and in addition to collect fossil specimens in Sioux and Dawes Counties, Nebr.

June 8, 1929, George H. Sherwood, director, American Museum of Natural History, New York City, was granted permission to conduct archæological reconnaissance in territory adjacent to Montezuma Creek and Grand Gulch, southeastern Utah, under supervision of Mr. Earle H. Morris of the seventh Bernheimer expedition of that institution.

June 25, 1929, Dr. Clark Wissler, American Museum of Natural History, New York City, was granted a renewal of previous permit to conduct during 1929, under the direction of Mr. Earle H. Morris, archaeological excavations and remove specimens from ruins in that portion of the Navajo Reservation, New Mexico, bounded on the northeast by the San Juan River, on the east by the Chaco Valley, on the south by the Chioska and Tunicha Mountains, and on the northwest by a line due north and south just west of the Carrizo Mountains; including the ruins in the Canyon de Chelly and Canyon del Muerto.

June 26, 1929, Dr. George Norlin, president, University of Colorado, Boulder, Colo., was authorized to collect archaeological specimens and conduct a reconnaissance during 1929 under the supervision of Mr. Earle H. Morris, within the area beginning at the La Plata River 2 miles north of the mouth of Cherry Creek, in La Plata County, Colo., due west to the Mancos River in Montezuma County, Colo., then southwestward along said river to the San Juan River, then along the San Juan River eastward to the mouth of the La Plata River and the point of beginning.

July 16, 1929, President C. C. O'Hara, South Dakota State School of Mines, Rapid City, S. Dak., was granted permission to collect fossil specimens on the Pine Ridge Indian Reservation, S. Dak., during the year 1929.

In submitting his report upon the work of the past year, the department archaeologist states that recent important scientific discoveries in the southwestern portion of the United States have resulted in renewed activity in this field, as reflected in the increased number of applications filed for archaeological permits by various institutions of the country. He adds that this growing interest points to a still greater number of applications for the coming year. Attention is called, however, to the corresponding increase in motor travel, which is annually bringing to the Southwest thousands of visitors and curio hunters, who have in the past carelessly or wantonly committed acts of vandalism, and from a scientific standpoint have destroyed many valuable ruins. In order to correct this condition he makes the following recommendations:

That efforts be made to educate the public to a proper appreciation of the value of scientific investigation by qualified institutions as contrasted with the destructive work of the curio seeker and vandal.

That all field employees, particularly in the Southwest, be made familiar with the "Act for the protection of American antiquities," and impressed with the importance of strictly enforcing this act and the prompt reporting to proper authorities of any violations thereof.

That Government field heads be authorized to arrest persons who appropriate, excavate, injure or destroy prehistoric ruins or monu-

ments on lands under the supervision of the department, and to seize any objects of antiquity unlawfully collected, for deposit in the proper national depositary.

That Indian traders and others operating stores and trading posts on lands of the department under permit be prohibited from purchasing, bartering or exposing for sale, archæological materials or objects of antiquity under penalty of revocation of license.

GENERAL EDUCATION BOARD

This corporation was created by act of Congress approved January 12, 1903, section 6 of which requires the corporation to annually file with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation, and the expenditure or other use or disposition of the same or the income thereof during the preceding year, and has for its object the promotion of education within the United States.

On June 30, 1929, the principal funds, belonging without restriction to the board, amounted to \$82,108,810.08. This is invested in stocks, bonds, secured demand loans, and a mortgage. Of this total \$41,289,114.68 has been appropriated to various educational institutions, including \$17,448,000 appropriated during the year ended June 30, 1929. The sum of \$10,625,695.86 was paid during the year on account of principal appropriations.

The income from the above funds, together with the income from undisbursed income, amounted during the year to \$5,852,525.78. The balance of income from the previous year as of June 30, 1928, amounting to \$12,705,302.53, together with sundry refunds amounting to \$455, increased the total to \$18,558,283.31.

Disbursements from income during the year were as follows:

For whites:

American Journal of Pathology-----	\$11, 250. 00
Universities and colleges—	
Endowment and general purposes-----	826, 200. 12
To increase teachers' salaries-----	17, 438. 34
County school consolidation-----	603. 14
Fellowships-----	27, 100. 00
Humanities-----	793, 238. 69
Industrial art-----	40, 993. 79
Lincoln School-----	100, 000. 00
Medical schools-----	803, 943. 15
National Academy of Sciences-----	28, 081. 90
National Research Council-----	9, 375. 00
Public education—colleges-----	64, 042. 40
Rural school agents-----	25, 364. 84
State departments of education—division of information and statistics, schoolhouse planning and construction, etc-----	92, 879. 57
Study of learned publications in the United States-----	8, 666. 64
Traveling professors-----	9, 250. 00

For negroes:

Colleges and schools—

Endowment and general purposes.....	\$611, 429. 01
To increase teachers' salaries.....	5, 000. 00
County training schools.....	4, 998. 27
Expenses of special students at summer schools.....	3, 561. 00
Fellowships.....	29, 200. 00
John F. Slater fund.....	110, 000. 00
Medical schools.....	46, 564. 78
National Association of Teachers in Colored Schools.....	1, 000. 00
National Research Council fellowship.....	2, 500. 00
Negro Rural School fund.....	85, 400. 00
Rural school agents.....	115, 612. 03
Summer schools.....	19, 091. 85
Training negro teachers in Arkansas high schools.....	6, 000. 00
Training negro teachers in private and denominational colleges.....	10, 000. 00

Miscellaneous:

Conferences.....	4, 715. 07
Improvement of accounting systems in educational institutions.....	2, 133. 10
Revision of paper on teachers' salaries.....	1, 914. 98
Rural school supervision.....	26, 950. 12
Studies in the field of public education.....	39, 769. 34
Administration.....	206, 291. 39

4, 190, 918. 52

This leaves an undisbursed balance of income on June 30, 1929, of \$14,367,364.79, which is invested as follows: Secured demand loans, \$14,056,050.69; accounts receivable, net, \$311,314.10. It should be noted, however, that against this balance there are unpaid appropriations amounting to \$13,304,302.51.

The Anna T. Jeanes fund, the income of which is to be used for negro rural schools, amounts to \$203,583.80. It is invested as follows: Bonds, \$125,488.80; stocks, \$16,645; secured demand loans, \$61,450. The income from this fund during the year was \$8,995.63. Added to the balance from the previous year, the total available income amounted to \$14,721.26. Of this, \$9,496.26 was appropriated and paid to various schools, leaving a balance of \$5,225 in secured demand loans.

THE FUEL ADMINISTRATION AND THE BITUMINOUS COAL COMMISSION RECORDS

A very careful examination of the records and files of the Fuel Administration was made by a committee designated by the department with a view to determining whether any of the same could be destroyed. The report of this committee, which was very full, recommending the destruction of certain of the papers in the files was duly submitted to Congress for consideration, under the provisions of the

act of February 16, 1889 (25 Stat. 672). No action was had thereon at the last session of Congress, but it is hoped that the matter will be disposed of in the coming session in 1929.

THE PERRY'S VICTORY MEMORIAL COMMISSION

As required by "An act creating a commission for the maintenance, control, care, and so forth of the Perry's Victory Memorial on Put in Bay Island, Lake Erie, Ohio, and for other purposes," approved March 3, 1919 (40 Stat. 1322), the ninth annual report of this commission to the Secretary of the Interior for the year ended December 1, 1928, indicated "the condition of the site and memorial as to preservation," and contained a detailed statement of "all receipts and disbursements of money pertaining thereto."

The physical condition of the memorial property was reported as "most satisfactory, including the approaches, plazas, and giant doric column, indicating the lasting nature of the construction." "The effects of incorrect drainage from the top of the column," continued the report, "have now entirely disappeared, and the dome of the rotunda, formerly discolored, is now completely whitened by the removal of moisture." The landscaping of the memorial grounds of 14 acres by aid of the appropriation by the Sixty-eighth Congress was declared to have "developed a beautiful public park," to which "in summer time the people resort in great numbers."

As in all previous years since opened to the public in 1915, the memorial during the year covered by the report continued self-sustaining as to all costs of operation and maintenance, and this notwithstanding adverse weather conditions materially reduced the gross receipts as compared with more prosperous previous years. The cash balance reported on hand December 1, 1927, was \$1,791.73. The total receipts for the year ended December 1, 1928, were \$8,598.25, and the total disbursements \$8,861.93, leaving a cash balance from the total amount available, at the date of filing the report, of \$1,528.05.

The receipts were \$593.49, and the disbursements \$1,154.52 less for 1928 than for 1927, the latter in part due to reduced expenses in connection with legislation and to aid the performance of contracts. The itemized statement showed expenses of \$263.68 in excess of receipts for 1928, but during the period of the report the commission paid \$400 for the new telephone cable through the grounds necessitated by the landscaping, \$120 on account of the contract for changing the drainage system, and \$306.56 expenses of the committee on disbursement of the Federal appropriation (Seventieth Congress) and approximately \$100 for office expenses due to the Federal appropriation; so that the earnings for 1928 were actually some \$400 in excess of the cost of operation.

The report itemizes \$17,897.51 of "extraordinary expenses paid from earnings" during six years and nine months prior to December 1, 1928, which were necessitated because the memorial and grounds were in a state of incompleteness when taken over by the Government in 1919.

"In filing the present report," it goes on to say, "we regard it proper to emphasize the fact that for the first time since the creation of this commission by Congress in 1919 we are dealing with the administration of a practically completed memorial. We anticipate making no further recommendations for appropriations by Congress for construction or improvements, such as those made and for the most part complied with in the past, to complete the original design, to insure the safety of the memorial from storms and the movement of ice, and to provide for landscaping the grounds, etc. It is with a sense of relief—which perhaps Congress and the Department of the Interior may share—that we now look back upon Federal aid to the memorial as a closed chapter. Aside from some catastrophe, we feel assured that any future public expenditures in its behalf will be at the instance of the Government and not at the solicitation of the commission."

Concerning the appropriation of \$14,374 by the Seventieth Congress (second deficiency bill, first session) for electric lighting (\$7,374) and a utility building on the grounds (\$7,000), the report states that the former was completed September 10, 1928, but that construction of the latter was postponed to the spring of 1929, to insure better weather conditions. In an informal supplementary report under date of September 9, 1929, anticipating the detailed report required to be filed December 1 next, the commission states that both contracts have been satisfactorily performed within the appropriation, leaving a balance of \$179 reverting to the United States Treasury.

The same supplementary report indicates that the memorial continued self-sustaining as to operation expenses during the season of 1929, though with slightly depleted earnings.

The "Foreword" and summary of "The year's work in brief" complete the text of this report. Annexed is an appendix of the more important statistical data, principally extracts from bureau and Territorial reports.

APPENDIX

SERVICE OF SECRETARIES OF THE INTERIOR

Name	When appointed	Whence appointed	President	Length of service
				<i>Yrs. mos. days</i>
1. Thomas Ewing.....	Mar. 8, 1849	Ohio.....	Taylor and Fillmore.....	1 5 8
2. Thomas M. T. McKennan.....	Aug. 15, 1850	Pennsylvania.....	Fillmore.....	-- -- 27
3. Alexander H. H. Steuart.....	Sept. 12, 1850	Virginia.....	do.....	2 5 25
4. Robert McClelland.....	Mar. 7, 1853	Michigan.....	Pierce.....	4 0 0
5. Jacob Thompson.....	Mar. 6, 1857	Mississippi.....	Buchanan.....	4 0 0
6. Caleb B. Smith.....	Mar. 5, 1861	Indiana.....	Lincoln.....	1 10 4
7. John P. Usher.....	Jan. 8, 1863	do.....	Lincoln and Johnson.....	2 4 7
8. James Harlan.....	May 15, 1865	Iowa.....	Johnson.....	1 2 12
9. Orville H. Browning.....	July 27, 1866	Illinois.....	do.....	2 7 10
10. Jacob B. Cox.....	Mar. 5, 1869	Ohio.....	Grant.....	1 7 27
11. Columbus Delano.....	Nov. 1, 1870	do.....	do.....	4 11 19
12. Zachariah Chandler.....	Oct. 19, 1875	Michigan.....	do.....	1 4 25
13. Carl Schurz.....	Mar. 12, 1877	Missouri.....	Hayes.....	3 11 24
14. Samuel J. Kirkwood.....	Mar. 5, 1881	Iowa.....	Garfield and Arthur.....	1 1 2
15. Henry M. Teller.....	Apr. 17, 1882	Colorado.....	Arthur.....	2 11 0
16. Lucius Q. C. Lamar.....	Mar. 6, 1885	Mississippi.....	Cleveland.....	2 10 10
17. William F. Vilas.....	Jan. 16, 1888	Wisconsin.....	do.....	1 1 22
18. John W. Noble.....	Mar. 6, 1889	Missouri.....	Harrison.....	4 0 0
19. Hoke Smith.....	Mar. 6, 1893	Georgia.....	Cleveland.....	3 5 25
20. David R. Francis.....	Sept. 1, 1896	Missouri.....	do.....	-- 6 5
21. Cornelius N. Bliss.....	Mar. 5, 1897	New York.....	McKinley.....	1 11 15
22. Ethan Allen Hitchcock.....	Dec. 21, 1898 ¹	Missouri.....	McKinley and Roosevelt.....	8 0 13
23. James R. Garfield.....	Jan. 15, 1907 ²	Ohio.....	Roosevelt.....	2 0 0
24. Richard A. Ballinger.....	Mar. 5, 1909	Washington.....	Taft.....	2 0 5
25. Walter L. Fisher.....	Mar. 7, 1911	Illinois.....	do.....	1 11 26
26. Franklin K. Lane.....	Mar. 6, 1913	California.....	Wilson.....	6 11 3 26
27. John Barton Payne.....	Feb. 28, 1920 ⁴	Illinois.....	do.....	-- 11 20
28. Albert B. Fall.....	Mar. 5, 1921 ⁵	New Mexico.....	Harding.....	2 -- --
29. Hubert Work.....	Mar. 5, 1923 ⁶	Colorado.....	Harding and Coolidge.....	5 4 19
30. Roy O. West.....	July 20, 1928	Illinois.....	Coolidge.....	-- 7 10
31. Ray Lyman Wilbur.....	Mar. 5, 1929	California.....	Hoover.....	-- -- --

¹ Entered on duty Feb. 20, 1899.

² Entered on duty Mar. 5, 1907.

³ The last day of Mr. Lane's service was Feb. 29, 1920.

⁴ Entered on duty Mar. 15, 1920.

⁵ Mr. Fall resigned, effective Mar. 4, 1923.

⁶ Doctor Work resigned, effective July 24, 1928.

TABLES

NOTE.—This appendix does not include all tables published in the bureau and territorial reports. It does include some not printed in those reports.

PUBLIC DOMAIN: CLASSIFICATION

Summary of lands subject to various public-land laws

	Acres
Vacant lands subject to all applicable public land laws.....	190, 031, 722. 00
National forest lands subject to all mining laws and possible homestead entry.....	134, 000, 000. 00
Stock-raising homesteads; all minerals reserved.....	20, 232, 398. 44
All minerals reserved in patents under various acts other than the stock-raising homestead law.....	68, 086. 81
Coal reserved.....	10, 569, 606. 32
Oil, gas, phosphate, or other specific mineral reserved.....	1, 309, 958. 06
Total, subject to all or some of the applicable public land laws.....	356, 211, 771. 63

Public lands surveyed and remaining unsurveyed in public-land States, including Alaska

States	Area	Surveyed during fiscal year ended June 30, 1929	Surveyed to June 30, 1929	Unsurveyed to June 30, 1929	Resurveyed during fiscal year ended June 30, 1929
	Acres	Acres	Acres	Acres	Acres
Alabama.....	32, 818, 560		32, 818, 560		
Alaska.....	378, 165, 760	3, 426	1, 910, 951	376, 254, 809	
Arizona.....	72, 838, 400	596, 476	43, 129, 816	29, 708, 584	14, 985
Arkansas.....	33, 616, 000		33, 616, 000		
California.....	99, 617, 280	60, 085	82, 831, 503	16, 785, 777	16, 630
Colorado.....	66, 341, 120	34, 455	64, 208, 597	2, 132, 523	183, 977
Florida.....	35, 111, 040	12, 094	35, 111, 040		32, 810
Idaho.....	53, 346, 560	358, 433	39, 578, 836	13, 767, 724	5, 578
Illinois.....	35, 867, 520	13	35, 867, 520		
Indiana.....	23, 068, 800		23, 068, 800		
Iowa.....	35, 575, 040		35, 575, 040		
Kansas.....	52, 335, 360		52, 335, 360		
Louisiana.....	29, 061, 760	1, 480	29, 061, 760		
Michigan.....	36, 787, 200	42	36, 787, 200		
Minnesota.....	51, 749, 120	444	51, 749, 120		929
Mississippi.....	29, 671, 680	329	29, 671, 680		
Missouri.....	43, 985, 280		43, 985, 280		
Montana.....	93, 568, 640	460, 832	81, 513, 047	12, 055, 593	
Nebraska.....	49, 157, 120	398	49, 157, 120		
Nevada.....	70, 285, 440	251, 439	47, 129, 551	23, 155, 889	
New Mexico.....	78, 401, 920	22, 564	65, 846, 536	12, 555, 384	196, 285
North Dakota.....	44, 917, 120		44, 917, 120		
Ohio.....	26, 073, 600		26, 073, 600		
Oklahoma.....	44, 424, 960		44, 424, 960		
Oregon.....	61, 188, 480	165, 835	55, 347, 151	5, 841, 329	
South Dakota.....	49, 195, 520	10, 266	49, 051, 983	143, 537	
Utah.....	52, 597, 760	537, 518	37, 946, 154	14, 651, 606	
Washington.....	42, 775, 040	31, 357	36, 206, 724	6, 568, 316	49, 907
Wisconsin.....	35, 363, 840	1, 976	35, 363, 840		
Wyoming.....	62, 460, 160	43, 572	58, 984, 390	3, 475, 770	287, 552
Total.....	1, 820, 366, 080	2, 593, 034	1, 303, 269, 239	517, 096, 841	788, 653

Aggregate area of surveys and resurveys accepted in the fiscal year 1929=3,381,687 acres.

NOTE.—In Florida, Illinois, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, and Wisconsin, the lands surveyed last year were not regarded as public lands when the lands surrounding were originally surveyed, and are counted in the aggregate of each State.

Estimated area of existing national forests, June 30, 1929 (a little over 86 per cent is public)

Acres		Acres	
Alabama.....	198,385	New Mexico.....	9,915,383
Alaska.....	21,397,515	North Carolina.....	1,690,252
Arizona.....	12,266,923	Oklahoma.....	61,640
Arkansas.....	1,690,224	Oregon.....	15,520,528
California.....	23,987,009	Pennsylvania.....	739,277
Colorado.....	14,774,106	Porto Rico.....	65,950
Florida.....	620,228	South Carolina.....	137,216
Georgia.....	672,094	South Dakota.....	1,269,812
Idaho.....	20,648,230	Tennessee.....	876,056
Illinois.....	10,710	Utah.....	7,981,730
Maine.....	115,558	Virginia.....	1,237,800
Michigan.....	589,004	Washington.....	11,262,495
Minnesota.....	1,966,804	West Virginia.....	819,100
Montana.....	19,086,317	Wyoming.....	8,641,238
Nebraska.....	207,209		
Nevada.....	5,245,606	Total area.....	184,564,953
New Hampshire.....	870,554		
		Acres	
Area added to national forests during year.....		1,121,258	
Area excluded from national forests during year.....		960,124	
Area within temporary forest withdrawals June 30, 1929.....		255,520	
Area of existing national forests June 30, 1928.....		184,403,819	
Area of existing national forests June 30, 1929.....		184,564,953	

Area of vacant, unappropriated, and unreserved public lands ¹

State	Area, in acres		
	Surveyed	Unsurveyed	Total
Arizona.....	9,065,367	7,846,000	16,911,367
Arkansas.....	205,933	-----	205,933
California.....	14,459,737	5,749,684	20,209,421
Colorado.....	7,082,181	1,136,694	8,218,875
Florida.....	7,193	6,662	13,855
Idaho.....	8,851,615	1,882,805	10,734,420
Minnesota.....	197,996	-----	197,996
Montana.....	6,821,824	78,320	6,900,144
Nebraska.....	28,960	-----	28,960
Nevada.....	31,318,305	22,092,633	53,410,938
New Mexico.....	15,117,955	1,164,627	16,282,582
North Dakota.....	152,113	-----	152,113
Oregon.....	13,134,730	92,411	13,227,141
South Dakota.....	402,670	-----	402,670
Utah.....	13,192,133	11,955,734	25,147,867
Washington.....	937,701	14,202	951,903
Wyoming.....	16,218,036	817,501	17,035,537
Total.....	137,194,449	52,837,273	190,031,722

¹ Circular No. 1197, Vacant Public Lands, can be had on application to the Commissioner of the General Land Office, Washington, D. C., which shows by States, land districts, and counties the areas of vacant, unappropriated, and unreserved public land, surveyed and unsurveyed, with a brief statement of their character.

Summary of enlarged homestead designations, in acres

[Areas classified as arid and nonirrigable, residence by entryman required: Act of Feb. 19, 1909 (35 Stat. 639), applicable to Arizona, Colorado, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming; act of June 17, 1910 (36 Stat. 531), applicable to Idaho; act of June 13, 1912 (37 Stat. 132) applicable to California, North Dakota; act of Mar. 3, 1915 (38 Stat. 953), applicable to Kansas; act of Mar. 4, 1915 (38 Stat. 1163), applicable to South Dakota. Areas classified as arid, nonirrigable, and lacking domestic water supply, residence by entryman not required: Act of Feb. 19, 1909 (35 Stat. 639), applicable to Utah; act of June 17, 1910 (36 Stat. 531), applicable to Idaho]

State	Designations prior to July 1, 1928	Cancellations prior to July 1, 1928	Designations outstanding prior to July 1, 1928	Designations during fiscal year	Cancellations during fiscal year	Designations outstanding June 30, 1929
Arizona.....	31,502,584	5,870,874	25,631,710	30,120	13,440	25,648,390
California.....	13,333,226	240,453	13,092,773	48,207	-----	13,140,980
Colorado.....	33,810,627	195,508	33,615,119	162,165	920	33,776,364
Idaho:						
Total.....	13,754,190	461,365	13,292,825	2,126	-----	13,294,951
Nonresidence.....	573,227	4,233	568,994	-----	-----	568,994
Kansas.....	651,364	-----	651,364	-----	-----	651,364
Montana.....	53,485,650	245,728	53,239,922	2,011	-----	53,241,933
Nevada.....	50,168,165	3,580,717	46,587,448	50,379	-----	46,637,827
New Mexico.....	43,837,357	227,732	43,609,625	11,650	160	43,621,115
North Dakota.....	12,280,704	3,848	12,276,856	-----	-----	12,276,856
Oregon.....	21,282,311	989,902	20,292,409	-----	-----	20,292,409
South Dakota.....	16,340,761	348,170	15,992,591	2,080	-----	15,994,671
Utah:						
Total.....	11,654,776	701,484	10,953,292	93,294	344,833	10,701,753
Nonresidence.....	1,650,911	81,880	1,569,031	-----	344,833	1,224,198
Washington.....	6,660,452	251,842	6,408,610	-----	-----	6,408,610
Wyoming.....	29,677,292	162,043	29,515,249	99,814	-----	29,615,063
	338,439,459	13,279,666	325,159,793	501,846	359,353	325,302,286

Summary of stock-raising homestead designations, in acres

Areas classified as nonirrigable, nontimbered, chiefly valuable for grazing and raising forage crops, and of such character that 640 acres is reasonably required for the support of a family, act of Dec. 29, 1916 (39 Stat. 862)]

State	Designations prior to July 1, 1928	Cancellations prior to July 1, 1928	Designations outstanding prior to July 1, 1928	Designations during fiscal year	Cancellations during fiscal year	Designations outstanding June 30, 1929
Arizona.....	14,056,666	887,580	13,169,086	98,207	-----	13,267,293
Arkansas.....	1,120	-----	1,120	-----	-----	1,120
California.....	7,965,904	3,400	7,962,504	64,471	-----	8,026,975
Colorado.....	8,647,578	18,920	8,628,658	224,484	920	8,852,222
Florida.....	480	480	-----	-----	-----	-----
Idaho.....	5,545,291	1,854	5,543,437	51,719	-----	5,595,156
Kansas.....	115,139	-----	115,139	640	-----	115,779
Michigan.....	3,491	-----	3,491	-----	-----	3,491
Montana.....	15,487,123	17,081	15,470,042	127,252	-----	15,597,294
Nebraska.....	202,184	-----	202,184	3,977	-----	206,161
Nevada.....	586,080	3,120	582,960	10,537	-----	593,506
New Mexico.....	31,363,953	636	31,363,317	144,213	-----	31,507,530
North Dakota.....	383,700	-----	383,700	-----	-----	383,700
Oklahoma.....	83,610	-----	83,610	1,308	-----	84,918
Oregon.....	6,355,378	3,128	6,352,250	29,068	-----	6,381,318
South Dakota.....	6,510,043	550	6,509,498	9,498	-----	6,518,996
Utah.....	1,796,149	7,800	1,788,349	142,173	-----	1,930,522
Washington.....	694,686	1,174	693,512	-----	-----	693,512
Wyoming.....	20,278,111	6,373	20,271,738	236,130	800	20,507,068
	120,076,700	952,096	119,124,604	1,143,677	1,720	120,266,561

Summary of outstanding mineral withdrawals and classifications, June 30, 1929, in acres

State	Coal		Oil		Oil shale		Phosphate		Potash
	With- drawn	Classified as coal land	With- drawn	Classi- fied as oil land	With- drawn	Classi- fied as oil- shale land	With- drawn	Classi- fied as phos- phate land	With- drawn
Alaska.....		56,993							
Arizona.....	139,415		356						
Arkansas.....		61,160							
California.....	17,603	8,720	1,178,392						90,357
Colorado.....	4,142,233	3,082,272	218,997		64,560	952,239			
Florida.....							67,076	120	
Idaho.....	4,761	4,603					391,532	268,299	
Louisiana.....			466,990	4,233					
Montana.....	7,863,941	8,563,862	1,350,426	67,651			279,944	3,833	
Nevada.....	83,673				123				39,422
New Mexico.....	5,084,069	570,372							9,282,160
North Dakota.....	5,954,364	11,178,286	84,894						
Oregon.....	4,361	18,887							
South Dakota.....		250,093							
Utah.....	3,636,541	1,267,697	1,341,264		91,464	2,703,755	277,344	2,937	
Washington.....	691,801	141,444							
Wyoming.....	2,260,604	6,740,594	541,777			460,103	989,149	25,293	
	29,883,366	31,944,983	5,183,096	71,884	156,147	4,116,097	2,005,045	300,482	9,411,939

^a Includes 3,151 acres of coal land reserved for use of the United States (coal reserve No. 1).

^b Includes 2,078 acres of coal land reserved for use of the United States (coal reserve No. 2).

Power-site reserves, in acres

[Includes all areas reserved or classified as valuable for power purposes and withheld subject to disposal only under the Federal water-power act of June 10, 1920 (41 Stat. 1063). Designations, classifications, and other types of reserves are included in the total areas without distinction]

State	Reserved prior to July 1, 1928	Eliminated prior to July 1, 1928	Reserves outstand- ing prior to July 1, 1928	Reserved during fiscal year	Eliminated during fiscal year	Reserves outstand- ing June 30, 1929
Alabama.....	2,377		2,377			2,377
Alaska.....	247,066	520	246,546	35,861		282,407
Arizona.....	1,282,976	124,012	1,158,964	13,380	15	1,172,329
Arkansas.....	29,671	360	29,311			29,311
California.....	1,368,036	30,243	1,337,793	68,839	3,037	1,403,595
Colorado.....	537,520	77,020	460,500	20,100	5,210	475,390
Florida.....	1,131		1,131			1,131
Idaho.....	605,642	191,534	414,108	5,061		419,169
Michigan.....	1,240		1,240			1,240
Minnesota.....	19,062	532	18,530			18,530
Mississippi.....	3		3			3
Montana.....	304,489	96,379	208,110	1,378	280	209,208
Nebraska.....	761		761			761
Nevada.....	301,196	480	300,716	58,019		358,735
New Mexico.....	270,878	10,511	260,367	49	732	259,684
Oregon.....	769,204	123,963	645,241	16,063	19,521	641,783
South Dakota.....	636		636			636
Utah.....	771,933	126,518	645,415	7,436	3,720	649,131
Washington.....	398,015	53,835	344,180	51,849	52	395,977
Wisconsin.....	1,866	226	1,640	40		1,680
Wyoming.....	232,477	76,284	156,193	300		156,493
	7,146,179	912,417	6,233,762	278,375	32,567	6,479,570

Summary of outstanding water-resources withdrawals and classifications, June 30, 1929, in acres

State	Power reserves					Reservoir with- drawals	Public water reserves
	With- draw- als	Classifica- tions	Designa- tions *	Miscella- neous	Total		
Alabama.....	120	1, 735	-----	522	2, 377	-----	-----
Alaska.....	93, 415	105, 425	-----	83, 567	282, 407	-----	-----
Arizona.....	386, 244	50, 082	528, 237	207, 766	1, 172, 329	23, 040	19, 425
Arkansas.....	21, 994	1, 590	-----	5, 727	29, 311	-----	-----
California.....	285, 055	359, 219	-----	759, 321	1, 403, 595	1, 160	199, 506
Colorado.....	225, 463	193, 989	-----	55, 938	475, 390	1, 728	7, 540
Florida.....	-----	-----	-----	1, 131	1, 131	-----	-----
Idaho.....	206, 272	195, 364	-----	17, 533	419, 169	-----	14, 345
Michigan.....	1, 240	-----	-----	-----	1, 240	-----	-----
Minnesota.....	12, 309	-----	-----	6, 221	18, 530	-----	-----
Mississippi.....	-----	-----	-----	3	3	-----	-----
Montana.....	130, 337	53, 862	-----	25, 009	209, 208	9, 080	9, 017
Nebraska.....	761	-----	-----	-----	761	-----	-----
Nevada.....	27, 492	85, 866	-----	245, 377	358, 735	-----	12, 101
New Mexico.....	116, 474	49	143, 161	-----	259, 634	-----	11, 001
North Dakota.....	-----	-----	-----	-----	-----	1, 569	-----
Oregon.....	355, 272	194, 280	15, 250	76, 981	641, 783	10, 619	25, 941
South Dakota.....	-----	-----	-----	636	636	-----	240
Utah.....	438, 655	176, 204	-----	34, 272	649, 131	80	35, 970
Washington.....	97, 034	226, 775	-----	72, 168	395, 977	35, 943	920
Wisconsin.....	-----	-----	-----	1, 680	1, 680	-----	-----
Wyoming.....	79, 953	35, 407	-----	41, 133	156, 493	1, 714	82, 425
	2, 478, 090	1, 679, 847	686, 648	1, 634, 985	6, 479, 570	84, 933	418, 431

* Designated and not otherwise withdrawn.

Public water reserves

[Includes areas withdrawn under the act of June 25, 1910 (41 Stat. 1063), as amended by the act of Aug. 24, 1912 (37 Stat. 497), and reserved for public use of springs or water holes in accordance with the provisions of sec. 10 of the act of Dec. 29, 1916 (39 Stat. 862), or for watershed protection, drainage reservoirs, or other similar miscellaneous public purposes involving water conservation]

State	Reserved prior to July 1, 1928	Elimi- nated prior to July 1, 1928	Reserves out- standing prior to July 1, 1928	Reserved during fiscal year	Elimi- nated during fiscal year	Reserves out- standing June 30, 1929
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	21, 782	1, 632	20, 150	-----	725	19, 425
California.....	205, 924	7, 138	198, 786	720	-----	199, 506
Colorado.....	5, 220	360	4, 860	2, 680	-----	7, 540
Idaho.....	14, 315	410	13, 905	440	-----	14, 345
Montana.....	10, 009	1, 152	8, 857	240	80	9, 017
Nevada.....	14, 426	3, 250	11, 176	925	-----	12, 101
New Mexico.....	10, 401	520	9, 881	1, 120	-----	11, 001
Oregon.....	22, 549	1, 288	21, 261	4, 680	-----	25, 941
South Dakota.....	240	-----	240	-----	-----	240
Utah.....	41, 526	7, 596	33, 930	2, 040	-----	35, 970
Washington.....	920	-----	920	-----	-----	920
Wyoming.....	92, 845	13, 420	79, 425	3, 640	640	82, 425
Total.....	440, 157	36, 766	403, 391	16, 485	1, 445	418, 431

General summary of cases involving land classification

Class of cases	Record for fiscal year 1929						Record since receipt of first case	
	Pending July 1, 1928	Received during fiscal year	Total	Acted on during fiscal year	Pending June 30, 1929	Gain or loss during fiscal year	Received	Acted on
General Land Office requests:								
General.....	344	922	1,266	966	300	+44		
Time extensions.....	41	636	677	671	6	+35	2,313	2,307
Oil development.....	1,607	3,253	4,860	4,843	17	+1,590	16,111	16,094
Applications for classification as to mineral:								
General.....	1	0	1	1	0	+1	10	10
Coal.....	3	5	8	5	3	-----	782	779
Oil.....	98	632	730	474	256	-158	7,338	7,082
Phosphate.....	0	1	1	1	0	-----	38	38
Applications for mineral permits.....	383	3,748	4,131	4,093	38	+345	52,505	52,467
Applications for mineral leases.....	12	102	114	102	12	-----	1,332	1,320
Applications for patent, potassium.....	1	0	1	1	0	+1	124	124
Federal Power Commission cases:								
Preliminary permits.....	10	9	19	8	11	-1	78	67
Licenses.....	0	1	1	1	0	-----	25	25
Determinations under sec. 24.....	8	29	37	35	2	+6	227	225
Applications for reclassification as to water resources.....	18	48	66	43	23	-5	759	736
Applications for rights of way.....	31	155	186	151	35	-4	6,224	6,189
Irrigation project reports.....	4	2	6	6	0	+4	911	911
Applications under enlarged-homestead acts.....	214	397	611	345	266	-52	56,809	56,543
Applications under stock-raising homestead acts.....	1,704	4,277	5,981	3,640	2,341	-637	126,217	123,876
Applications under ground-water reclamation act.....	8	57	65	26	39	-31	935	896
Indian Office requests for information.....	0	6	6	6	0	-----	9,511	9,511
Cases in national forests.....	1	11	12	10	2	-1	335	333
	4,488	14,291	18,779	15,428	3,351	+1,137	-----	-----

PUBLIC DOMAIN: STATISTICS RELATING TO DISPOSITION

Area of States and Territories

[Based upon careful joint calculations made in the General Land Office, the Geological Survey, and the Bureau of the Census]

State or Territory	Land surface		Water surface		Total areas	
	<i>Sq. miles</i>	<i>Acres</i>	<i>Sq. miles</i>	<i>Acres</i>	<i>Sq. miles</i>	<i>Acres</i>
Alabama.....	51,279	32,818,560	719	460,160	51,998	33,278,720
Arizona.....	113,810	72,838,400	146	93,440	113,956	72,931,840
Arkansas.....	52,525	33,616,000	810	518,400	53,335	34,134,400
California.....	155,652	99,617,280	2,645	1,692,800	158,297	101,310,080
Colorado.....	103,658	66,341,120	290	185,600	103,948	66,526,720
Connecticut.....	4,820	3,084,800	145	92,800	4,965	3,177,600
Delaware.....	1,965	1,257,600	405	259,200	2,370	1,516,800
District of Columbia.....	62	39,680	8	5,120	70	44,800
Florida.....	54,861	35,111,040	3,805	2,435,200	58,666	37,546,240
Georgia.....	58,725	37,584,000	540	345,600	59,265	37,929,600
Idaho.....	83,354	53,346,560	534	341,760	83,888	53,688,320
Illinois.....	56,043	35,867,520	622	398,080	56,665	36,265,600
Indiana.....	36,045	23,068,800	309	197,760	36,354	23,266,560
Iowa.....	55,586	35,575,040	561	359,040	56,147	35,934,080
Kansas.....	81,774	52,335,360	384	245,760	82,158	52,581,120
Kentucky.....	40,181	25,715,840	417	266,880	40,598	25,982,720
Louisiana.....	45,409	29,061,760	3,097	1,982,080	48,506	31,043,840
Maine.....	29,895	19,132,800	3,145	2,012,800	33,040	21,145,600
Maryland.....	9,941	6,362,240	2,386	1,527,040	12,327	7,889,280
Massachusetts.....	8,039	5,144,960	227	145,280	8,266	5,290,240
Michigan.....	57,480	36,787,200	500	320,000	57,980	37,107,200
Minnesota.....	80,858	51,749,120	3,824	2,447,360	84,682	54,196,480
Mississippi.....	46,362	29,671,680	503	321,920	46,865	29,993,600
Missouri.....	68,727	43,985,280	693	443,520	69,420	44,428,800
Montana.....	146,201	93,568,640	796	509,440	146,997	94,078,080
Nebraska.....	76,808	49,157,120	712	455,680	77,520	49,612,800
Nevada.....	109,821	70,285,440	869	556,160	110,690	70,841,600
New Hampshire.....	9,031	5,779,840	310	198,400	9,341	5,978,240
New Jersey.....	7,514	4,808,960	710	454,400	8,224	5,263,360
New Mexico.....	122,503	78,401,920	131	83,840	122,634	78,485,760
New York.....	47,654	30,498,560	1,550	992,000	49,204	31,490,560
North Carolina.....	48,740	31,193,600	3,686	2,359,040	52,426	33,552,640
North Dakota.....	70,183	44,917,120	654	418,560	70,837	45,335,680
Ohio.....	40,740	26,073,600	300	192,000	41,040	26,265,600
Oklahoma.....	69,414	44,424,960	643	411,520	70,057	44,836,480
Oregon.....	95,607	61,188,480	1,092	698,880	96,699	61,887,360
Pennsylvania.....	44,832	28,692,480	294	188,160	45,126	28,880,640
Rhode Island.....	1,067	682,880	181	115,840	1,248	798,720
South Carolina.....	30,495	19,516,800	494	316,160	30,989	19,832,960
South Dakota.....	76,808	49,155,520	747	478,080	77,555	49,633,600
Tennessee.....	41,687	26,679,680	335	214,400	42,022	26,894,080
Texas.....	262,398	167,934,720	3,498	2,238,720	265,896	170,173,440
Utah.....	82,184	52,597,760	2,806	1,795,840	84,990	54,393,600
Vermont.....	9,124	5,839,360	440	281,600	9,564	6,120,960
Virginia.....	40,262	25,767,680	2,365	1,513,600	42,627	27,281,280
Washington.....	66,836	42,775,040	2,291	1,466,240	69,127	44,241,280
West Virginia.....	24,022	15,374,080	148	94,720	24,170	15,468,800
Wisconsin.....	55,256	35,363,840	810	518,400	56,066	35,882,240
Wyoming.....	97,594	62,460,160	320	204,800	97,914	62,664,960
Alaska.....	2,973,892	1,903,290,880	52,897	33,854,080	3,026,789	1,937,144,960
Guam.....	.....	.....	.....	.....	590,884	378,165,760
Hawaii.....	.....	.....	.....	.....	206	131,840
Canal Zone.....	.....	.....	.....	.....	6,406	4,099,840
Philippine Islands.....	.....	.....	.....	.....	549	351,360
Porto Rico ¹.....	.....	.....	.....	.....	114,400	73,216,000
American Samoa.....	.....	.....	.....	.....	3,435	2,198,400
Virgin Islands.....	.....	.....	.....	.....	75	48,000
Total.....	.....	.....	.....	.....	133	85,120
Total.....	.....	.....	.....	.....	3,742,877	2,395,441,280

¹ Including adjacent islands.

Owing to their location adjoining the Great Lakes, the States enumerated below contain approximately an additional number of square miles as follows: Illinois, 1,674 square miles of Lake Michigan; Indiana, 230 square miles of Lake Michigan; Michigan, 16,653 square miles of Lake Superior, 12,922 square miles of Lake Michigan, 9,925 square miles of Lake Huron, and 460 square miles of Lakes St. Clair and Erie; Minnesota, 2,514 square miles of Lake Superior; New York, 3,140 square miles of Lakes Ontario and Erie; Ohio, 3,443 square miles of Lake Erie; Pennsylvania, 891 square miles of Lake Erie; Wisconsin, 2,378 square miles of Lake Superior and 7,500 square miles of Lake Michigan.

In addition to the water areas noted above, California claims jurisdiction over all Pacific waters lying within 3 English miles of her coast; Oregon claims jurisdiction over a similar strip of the Pacific Ocean 1 marine league in width between latitude 42° north and the mouth of the Columbia River, and Texas claims jurisdiction over a strip of Gulf waters 3 leagues in width adjacent to her coast and between the Rio Grande and the Sabine Rivers.

*Land and scrip granted to States and Territories for educational and other purposes
(1929)*

State or Territory and purpose of grant	Amount granted	Total by States
Alabama:	<i>Acres</i>	<i>Acres</i>
Tuskegee Normal and Industrial Institute.....	25,000.00	
Industrial school for girls.....	25,000.00	
Seminary of learning.....	46,080.00	
Internal improvements, including river and shoals.....	500,000.00	
Agricultural college scrip.....	240,000.00	
Common schools, section 16.....	911,627.00	
Salt springs and contiguous lands.....	23,040.00	
Seat of government.....	1,620.00	
University.....	46,080.00	
Searcy Hospital for Colored Insane.....	181.41	
Swamp.....	418,715.56	
Swamp-land indemnity.....	20,920.08	
		2,258,264.05
Alaska Territory:		
Common schools, sections 16 and 36, reserved (estimated).....	21,009,209.00	
Agricultural college and school of mines, certain sections 33, reserved (estimated).....	336,000.00	
Agricultural college and school of mines (act Jan. 21, 1929).....	109,000.00	
		21,445,209.00
Arizona:		
University.....	246,080.00	
Public buildings.....	100,000.00	
Penitentiaries.....	100,000.00	
Insane asylums.....	100,000.00	
Deaf, dumb, and blind asylum.....	100,000.00	
Miners' hospital.....	50,000.00	
Normal schools.....	200,000.00	
Charitable, penal, etc.....	100,000.00	
Agricultural and mechanical colleges.....	150,000.00	
School of mines.....	150,000.00	
Military institutes.....	100,000.00	
Payment of bonds issued to Maricopa, Pima, Yavapai, and Coconino Counties.....	1,000,000.00	
Common schools, sections 2 and 32, 16 and 36.....	8,093,156.00	
Miners' hospitals (act Feb. 20, 1929).....	50,000.00	
		10,539,236.00
Arkansas:		
Internal improvements.....	500,000.00	
University.....	46,080.00	
Public buildings.....	10,600.00	
Agricultural college scrip.....	150,000.00	
Common schools, section 16.....	933,778.00	
Salt springs and contiguous lands.....	46,080.00	
Swamp.....	7,686,455.37	
		9,372,993.37
California:		
Internal improvements.....	500,000.00	
University.....	46,080.00	
Public buildings.....	6,400.00	
Agricultural and mechanical colleges.....	150,000.00	
Common schools, sections 16 and 36.....	5,534,293.00	
Swamp.....	2,188,808.52	
		8,425,581.52
Colorado:		
Internal improvements.....	500,000.00	
University.....	46,080.00	
Public buildings.....	32,000.00	
Penitentiaries.....	32,000.00	
Agricultural college.....	90,000.00	
Common schools, sections 16 and 36.....	3,685,618.00	
Salt springs and contiguous lands.....	46,080.00	
State agricultural college.....	1,600.00	
Biological station.....	160.00	
		4,433,538.00
Connecticut: Agricultural college scrip.....		180,000.00
Delaware: Agricultural college scrip.....		90,000.00
Florida:		
Internal improvements.....	500,000.00	
Seminaries of learning.....	92,160.00	
Seat of government.....	5,120.00	
Agricultural college scrip.....	90,000.00	
Common schools, section 16.....	975,307.00	
Swamp.....	20,212,330.39	
Swamp-land indemnity.....	94,782.80	
		21,969,750.19
Georgia: Agricultural college scrip.....		270,000.00

*Land and scrip granted to States and Territories for educational and other purposes
(1929)—Continued*

State or Territory and purpose of grant	Amount granted	Total by States
	<i>Acres</i>	<i>Acres</i>
Idaho:		
Lava Hot Springs.....	187.30	
University.....	46,080.00	
University, Moscow.....	50,000.00	
Agricultural college.....	90,000.00	
Penitentiary.....	50,000.00	
Public buildings.....	32,000.00	
Insane asylum.....	50,000.00	
Educational, charitable, etc.....	150,000.00	
Normal schools.....	100,000.00	
Scientific schools.....	100,000.00	
Common schools, sections 16 and 36.....	2,963,698.00	
Fish culture (act Jan. 29, 1929).....	191.95	
		3,632,157.25
Illinois:		
Internal improvements, including canals.....	533,368.24	
Seminary of learning.....	46,080.00	
Seat of government.....	2,560.00	
Agricultural college scrip.....	480,000.00	
Common schools, section 16.....	996,320.00	
Salt springs and contiguous lands.....	121,029.00	
Swamp.....	1,457,559.20	
Swamp-land indemnity.....	2,309.07	
		3,639,225.51
Indiana:		
Internal improvements (canals and roads).....	1,916,804.56	
Seminary of learning.....	46,080.00	
Seat of government.....	2,560.00	
Agricultural college scrip.....	390,000.00	
Common schools, section 16.....	668,578.00	
Salt springs and contiguous lands.....	23,040.00	
Swamp.....	1,254,310.73	
Swamp-land indemnity.....	4,880.20	
		4,306,253.49
Iowa:		
Internal improvements.....	500,000.00	
University.....	46,080.00	
Public buildings.....	3,200.00	
Agricultural college.....	240,000.00	
Common schools, section 16.....	988,196.00	
Salt springs and contiguous lands.....	46,080.00	
Swamp.....	874,152.63	
Swamp-land indemnity.....	321,976.98	
		3,019,685.61
Kansas:		
Internal improvements.....	500,000.00	
University.....	46,080.00	
Public buildings.....	6,400.00	
Agricultural college.....	90,000.00	
Do.....	7,682.00	
Common schools, sections 16 and 36.....	2,907,520.00	
Salt springs and contiguous lands.....	46,080.00	
Game preserve.....	3,021.20	
		3,606,783.20
Kentucky:		
Deaf and dumb asylum.....	22,508.65	
Agricultural college scrip.....	330,000.00	
		352,508.65
Louisiana:		
University and agricultural college.....	211.56	
Internal improvements.....	500,000.00	
Seminary of learning.....	46,080.00	
Agricultural college scrip.....	210,000.00	
Common schools, section 16.....	807,271.00	
Swamp.....	9,424,545.60	
Swamp-land indemnity.....	32,630.97	
		11,020,739.13
Maine: Agricultural college scrip.....		210,000.00
Maryland: Agricultural college scrip.....		210,000.00
Massachusetts: Agricultural college scrip.....		360,000.00
Michigan:		
Internal improvements.....	\$500,000.00	
University.....	46,080.00	
Public buildings.....	3,200.00	
Agricultural college.....	240,000.00	
Common schools, section 16.....	1,021,867.00	
Salt springs and contiguous lands.....	46,080.00	
Swamp.....	5,656,071.73	
Swamp-land indemnity.....	24,038.69	
Canals.....	1,250,235.85	
		8,787,573.27

*Land and scrip granted to States and Territories for educational and other purposes
(1929)—Continued*

State or Territory and purpose of grant	Amount granted	Total by States
Minnesota:	<i>Acres</i>	<i>Acres</i>
Internal improvements.....	500,000.00	
University.....	92,160.00	
Public buildings.....	6,400.00	
Agricultural college.....	120,000.00	
Experimental forestry.....	20,000.00	
Public park.....	8,392.51	
Common schools, sections 16 and 36.....	2,874,951.00	
Salt springs and contiguous lands.....	46,080.00	
Swamp.....	4,701,543.34	
		8,369,526.85
Mississippi:		
Internal improvements.....	500,000.00	
Seminary of learning.....	69,120.00	
Seat of government.....	1,253.16	
Agricultural college scrip.....	210,000.00	
Common schools, section 16.....	824,213.00	
Swamp.....	3,289,638.73	
Swamp-land indemnity.....	56,781.76	
		4,951,006.65
Missouri:		
Internal improvements.....	500,000.00	
Seminary of learning.....	46,080.00	
Seat of government.....	2,560.00	
Agricultural college.....	330,000.00	
Common schools, section 16.....	1,221,813.00	
Salt springs and contiguous lands.....	46,080.00	
Swamp.....	3,346,936.01	
Swamp-land indemnity.....	81,016.69	
		5,574,485.70
Montana:		
University.....	46,080.00	
Agricultural college.....	140,000.00	
Public buildings.....	182,000.00	
Deaf and dumb asylum.....	50,000.00	
Reform school.....	50,000.00	
School of mines.....	100,000.00	
Normal schools.....	100,000.00	
Militia camp.....	640.00	
Observatory for university.....	480.00	
Biological station.....	160.00	
Common schools, sections 16 and 36.....	5,198,258.00	
Fort Assiniboine for educational institutions.....	2,000.00	
		5,869,618.00
Nebraska:		
Penitentiary.....	32,000.00	
Internal improvements.....	500,000.00	
University.....	46,080.00	
Public buildings.....	12,800.00	
Agricultural college.....	90,000.00	
Common schools, sections 16 and 36.....	2,730,951.00	
Salt springs and contiguous lands.....	46,080.00	
Dry-land agricultural experiments.....	800.00	
		3,458,711.00
Nevada:		
Internal improvements.....	500,000.00	
University.....	46,080.00	
Penitentiary.....	12,800.00	
Public buildings.....	12,800.00	
Mining and mechanic arts.....	90,000.00	
Common schools, sections 16 and 36, and lieu lands, act June 16, 1880.....	2,061,967.00	
		2,723,647.00
New Hampshire: Agricultural college scrip.....		150,000.00
New Jersey: Agricultural college scrip.....		210,000.00
New Mexico (act June 21, 1898):		
University.....	\$111,080.00	
Saline land (university).....	1,622.86	
Agricultural college.....	100,000.00	
Improvement of Rio Grande.....	100,000.00	
Penitentiary.....	50,000.00	
Public buildings.....	32,000.00	
Insane asylum.....	50,000.00	
Deaf and dumb asylum.....	50,000.00	
Reform school.....	50,000.00	
Normal schools.....	100,000.00	
School of mines.....	50,000.00	
Blind asylum.....	50,000.00	
Reservoirs.....	500,000.00	
Miners' hospital.....	50,000.00	
Military institute.....	50,000.00	
Common schools, sections 16 and 36.....	4,355,662.00	

*Land and scrip granted to States and Territories for educational and other purposes
(1929)—Continued*

State or Territory and purpose of grant	Amount granted	Total by States
New Mexico (act June 20, 1910):	<i>Acres</i>	<i>Acres</i>
University.....	200,000.00	
Public buildings.....	100,000.00	
Insane asylums.....	100,000.00	
Penitentiaries.....	100,000.00	
Deaf, dumb, and blind asylum.....	100,000.00	
Miners' hospitals.....	50,000.00	
Normal schools.....	200,000.00	
Charitable, penal, and reformatory.....	100,000.00	
Agricultural and mechanical colleges.....	150,000.00	
School of mines.....	150,000.00	
Military institutes.....	100,000.00	
Payment of bonds issued by Grant and Santa Fe Counties.....	1,000,000.00	
Common schools, sections 2 and 32.....	4,355,662.00	
Reimbursement of certain counties and town of Silver City (act May 28, 1928).....	250,000.00	
		12,656,026.86
New York: Agricultural college scrip.....		990,000.00
North Carolina: Agricultural college scrip.....		270,000.00
North Dakota:		
State historical society.....	75.50	
University.....	86,080.00	
Agricultural college.....	130,000.00	
Public buildings.....	82,000.00	
Educational, charitable, etc.....	170,000.00	
Deaf and dumb asylum.....	40,000.00	
Reform school.....	40,000.00	
School of mines.....	40,000.00	
Normal school.....	80,000.00	
Common schools, sections 16 and 36.....	2,495,396.00	
		3,163,551.50
Ohio:		
Internal improvements (canals and roads).....	1,019,071.98	
Seminaries of learning.....	69,120.00	
Agricultural college scrip.....	630,000.00	
Common schools, section 16.....	724,266.00	
Salt springs and contiguous lands.....	24,216.00	
Swamp.....	26,251.95	
		2,492,925.93
Oklahoma:		
Normal schools.....	300,000.00	
Oklahoma University.....	250,000.00	
University preparatory school.....	150,000.00	
Agricultural and mechanical college.....	250,000.00	
Colored agricultural and normal university.....	100,000.00	
Common schools, sections 16 and 36.....	1,375,000.00	
Certain sections 13 and 33.....	669,000.00	
Insane asylum.....	1,760.25	
		3,095,760.25
Oregon:		
Internal improvements.....	500,000.00	
University.....	46,080.00	
Public buildings.....	6,400.00	
Agricultural college.....	90,000.00	
Common schools, sections 16 and 36.....	3,399,360.00	
Salt springs and contiguous lands.....	46,080.00	
Public park.....	1,401.96	
Swamp.....	264,212.66	
		4,353,534.62
Pennsylvania: Agricultural college scrip.....		780,000.00
Rhode Island: Agricultural college scrip.....		120,000.00
South Carolina: Agricultural college scrip.....		180,000.00
South Dakota:		
University.....	86,080.00	
Agricultural college.....	160,000.00	
Public buildings.....	82,000.00	
Educational and charitable.....	170,000.00	
Deaf and dumb asylum.....	40,000.00	
Reform school.....	40,000.00	
School of mines.....	40,000.00	
Normal schools.....	80,000.00	
Missionary work.....	160.00	
Military camp ground.....	640.00	
Insane asylum.....	640.00	
Common schools, sections 16 and 36.....	2,733,084.00	
Public park.....	1,599.39	
		3,434,203.39
Tennessee: Agricultural college scrip.....		300,000.00
Texas: Agricultural college scrip.....		180,000.00

*Land and scrip granted to States and Territories for educational and other purposes
(1929)—Continued*

State or Territory and purpose of grant	Amount granted	Total by States
Utah:	<i>Acres</i>	<i>Acres</i>
University.....	156,080.00	
Agricultural college.....	200,000.00	
Public buildings.....	64,000.00	
Insane asylum.....	100,000.00	
Deaf and dumb asylum.....	100,000.00	
Reform school.....	100,000.00	
School of mines.....	100,000.00	
Normal schools.....	100,000.00	
Blind asylum.....	100,000.00	
Reservoirs.....	500,000.00	
Miners' hospital.....	50,000.00	
Common schools, sections 2, 16, 32, and 36.....	5,844,196.00	
Miners' hospitals (act Feb. 20, 1929).....	50,000.00	
		7,464,276.00
Vermont: Agricultural college scrip.....		150,000.00
Virginia: Agricultural college scrip.....		300,000.00
Washington:		
University.....	46,080.00	
Agricultural college.....	90,000.00	
Public buildings.....	132,000.00	
Educational and charitable.....	200,000.00	
Normal schools.....	100,000.00	
Scientific schools.....	100,000.00	
Common schools, sections 16 and 36.....	2,376,391.00	
		3,044,471.00
West Virginia: Agricultural college scrip.....		150,000.00
Wisconsin:		
Canal.....	338,626.97	
River improvement.....	683,722.43	
Internal improvements.....	500,000.00	
University.....	92,160.00	
Public buildings.....	6,400.00	
Agricultural college.....	240,000.00	
Forestry.....	20,000.00	
Common schools, section 16.....	982,329.00	
Swamp.....	3,251,985.36	
Swamp-land indemnity.....	105,047.99	
		6,220,271.75
Wyoming:		
University.....	46,080.00	
Agricultural college.....	90,000.00	
Public buildings.....	107,000.00	
Penitentiary.....	30,000.00	
Insane asylum.....	30,000.00	
Educational, penal, etc.....	290,000.00	
Deaf and dumb asylum.....	30,000.00	
Miners' hospital.....	30,000.00	
Fish hatcheries.....	5,480.00	
Poor farm.....	10,000.00	
Common schools, sections 16 and 36.....	3,470,009.00	
		4,138,569.00
Grand total.....		202,920,083.74

State grants, fiscal year ended June 30, 1929

Kind of selections	Pending and received			Disposed of			Pending June 30, 1929
	Pending July 1, 1928	Since received	Total	Approved	Canceled	Total	
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Swamp.....	56, 212. 01	177, 702. 08	233, 914. 09	11, 033. 00	142, 833. 02	153, 866. 02	80, 048. 07
School indemnity.....	475, 211. 54	139, 224. 09	614, 435. 63	169, 926. 88	20, 725. 76	190, 652. 64	423, 782. 99
University.....	290. 95	-----	290. 95	250. 36	-----	236. 36	54. 59
Penitentiaries.....	28. 10	-----	28. 10	-----	28. 10	28. 10	-----
Public buildings.....	12. 60	-----	12. 60	-----	-----	-----	12. 60
Educational, charitable, penal, and reformatory institutions.....	473. 21	-----	473. 21	159. 54	-----	159. 54	313. 67
Normal schools.....	523. 81	-----	523. 81	80. 00	-----	80. 00	443. 81
Bonds issued by Santa Fe and Grant Counties.....	2, 040. 00	-----	2, 040. 00	-----	2, 040. 00	2, 040. 00	-----
Public park.....	1, 272. 50	1, 169. 56	2, 442. 06	600. 00	-----	600. 00	1, 842. 06
Scientific schools.....	383. 03	366. 28	749. 31	240. 00	-----	240. 00	509. 31
Miners' hospitals.....	-----	2, 276. 71	2, 276. 71	-----	-----	-----	2, 276. 71
Reimbursement of certain counties and town of Silver City.....	-----	96, 727. 05	96, 727. 05	-----	159. 99	159. 99	96, 567. 06
Fish culture.....	-----	191. 95	191. 95	-----	-----	-----	191. 95
Seat of government.....	-----	1, 598. 27	1, 598. 27	1, 598. 27	-----	1, 598. 27	-----
Total specific grants.....	5, 024. 20	102, 329. 82	107, 354. 02	2, 914. 17	2, 228. 09	5, 142. 26	102, 211. 76
Grand total.....	536, 447. 75	419, 255. 99	955, 703. 74	183, 874. 05	165, 786. 87	349, 660. 92	606, 042. 82

State grants—Recapitulation

State	Swamp confirmed	School indemnity confirmed	Other grants confirmed	State	Swamp confirmed	School indemnity confirmed	Other grants confirmed
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>		<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alabama.....	1. 95	-----	1, 598. 27	New Mexico.....	-----	17, 371. 61	80. 00
Arizona.....	-----	20, 416. 75	-----	North Dakota.....	-----	120. 00	-----
California.....	261. 20	13, 468. 42	-----	Oregon.....	-----	9, 644. 10	600. 00
Florida.....	341. 10	103. 91	-----	South Dakota.....	-----	640. 00	-----
Idaho.....	-----	7, 342. 94	281. 77	Utah.....	-----	12, 984. 55	-----
Iowa.....	40. 00	-----	-----	Washington.....	-----	41, 320. 41	-----
Louisiana.....	1, 020. 42	-----	-----	Wisconsin.....	154. 94	-----	-----
Michigan.....	7. 70	-----	-----	Wyoming.....	-----	2, 334. 27	354. 13
Minnesota.....	7, 985. 46	-----	-----	Total.....	11, 033. 00	169, 926. 88	2, 914. 17
Mississippi.....	1, 220. 23	-----	-----				
Montana.....	-----	44, 179. 92	-----				

Withdrawals under the act of March 15, 1910 (36 Stat. 237), during the fiscal year ended June 30, 1929

State	Pending July 1, 1928	Applied for 1928-29	Rejected before withdrawal	Pending July 1, 1929	Remaining withdrawn July 1, 1928	Withdrawn 1928-29	Re-stored	Remaining withdrawn July 1, 1929
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Colorado.....	-----	-----	-----	-----	32, 096. 33	-----	-----	32, 096. 33
Idaho.....	-----	175, 263. 87	18, 555. 68	-----	-----	156, 708. 00	-----	156, 708. 00
Oregon.....	3, 324. 45	-----	-----	3, 324. 45	-----	-----	-----	-----
Wyoming.....	-----	-----	-----	-----	160. 00	-----	160. 00	-----
Total.....	3, 324. 45	175, 263. 87	18, 555. 68	3, 324. 45	32, 256. 33	156, 708. 00	160. 00	188, 804. 33

PUBLIC DOMAIN: MINERAL RESOURCES

*Applications filed under the mineral leasing act of February 25, 1920, from the
passage of the act to June 30, 1929*

Alabama: Montgomery.....	16	New Mexico:	
Alaska:		Clayton.....	37
Anchorage.....	1,434	Fort Sumner.....	147
Fairbanks.....	17	Las Cruces.....	3,847
Nome.....	157	Roswell.....	1,357
State total.....	1,608	Santa Fe.....	4,242
Arizona: Phoenix.....	1,840	Tucumcari.....	34
		State total.....	9,664
Arkansas:		North Dakota:	
Camden.....	2	Bismarck.....	233
Harrison.....	3	Dickinson.....	83
Little Rock.....	18	Minot.....	7
State total.....	23	Williston.....	15
		State total.....	338
California:		Oklahoma: Guthrie.....	557
El Centro.....	982		
Eureka.....	60	Oregon:	
Independence.....	665	La Grande.....	11
Los Angeles.....	1,873	Lakeview.....	26
Sacramento.....	994	Portland.....	19
San Francisco.....	931	Roseburg.....	92
Susanville.....	2	The Dalles.....	64
Visalia.....	14,937	Vale.....	22
State total.....	20,444	State total.....	234
		South Dakota:	
Colorado:		Bellefourche.....	20
Del Norte.....	45	Lemmon.....	31
Denver.....	2,189	Pierre.....	147
Durango.....	493	Rapid City.....	116
Glenwood Springs.....	3,134	Timber Lake.....	2
Lamar.....	68	State total.....	316
Leadville.....	27		
Montrose.....	711	Utah:	
Pueblo.....	1,522	Salt Lake City.....	11,473
Sterling.....	52	Vernal.....	752
State total.....	8,241	State total.....	12,225
Florida: Gainesville.....	1		
		Washington:	
Idaho:		Seattle.....	93
Blackfoot.....	731	Spokane.....	26
Boise.....	66	Vancouver.....	2
Coeur d'Alene.....	37	Walla Walla.....	23
Hailey.....	126	Waterville.....	6
State total.....	960	Yakima.....	67
Kansas: Topeka.....	5	State total.....	217
Louisiana: Baton Rouge.....	262		
Michigan: Marquette.....	3	Wyoming:	
Mississippi: Jackson.....	15	Buffalo.....	1,694
		Cheyenne.....	2,642
Montana:		Douglas.....	1,954
Billings.....	1,144	Evanston.....	7,066
Bozeman.....	112	Lander.....	1,581
Glasgow.....	1,106	Newcastle.....	890
Great Falls.....	6,087	State total.....	15,827
Havre.....	680		
Helena.....	107	Total for all States.....	86,209
Kalispell.....	15	General Land Office.....	29
Lewistown.....	1,486	Grand total.....	86,238
Miles City.....	950		
Missoula.....	20	Filings, Feb. 25 to June 30, 1920.....	4,853
State total.....	11,707	Filings, fiscal year 1921.....	10,575
Nebraska: Alliance.....	34	Filings, fiscal year 1922.....	4,785
		Filings, fiscal year 1923.....	5,823
Nevada:		Filings, fiscal year 1924.....	6,067
Carson City.....	1,413	Filings, fiscal year 1925.....	5,367
Elko.....	259	Filings, fiscal year 1926.....	11,971
State total.....	1,672	Filings, fiscal year 1927.....	26,509
		Filings, fiscal year 1928.....	5,614
		Filings, fiscal year 1929.....	4,674
		Grand total.....	86,238

Mineral leases, licenses, and permits on the public domain and naval petroleum reserves under supervision of the Geological Survey June 30, 1929

State	Coal						Oil and gas	
	Leases		Permits		Licenses		Leases (number)	Permits (number)
	Number	Acres	Number	Acres	Number	Acres		
Alaska.....	9	11,307.28	13	22,548.84	3	30.00	-----	1,025
Alabama.....	1	1,840.00	-----	-----	-----	-----	-----	2
Arizona.....	-----	-----	5	11,520.00	-----	-----	-----	439
Arkansas.....	-----	-----	2	2,199.88	-----	-----	-----	15
California.....	-----	-----	6	6,511.17	-----	-----	157	1,301
Colorado.....	77	12,252.60	36	22,542.90	5	200.00	12	1,749
Idaho.....	-----	-----	9	11,697.17	-----	-----	-----	269
Kansas.....	-----	-----	-----	-----	-----	-----	-----	1
Louisiana.....	-----	-----	-----	-----	-----	-----	10	21
Montana.....	50	6,168.17	12	7,840.00	10	396.29	58	1,387
Nebraska.....	-----	-----	-----	-----	-----	-----	-----	3
Nevada.....	-----	-----	5	7,821.88	-----	-----	-----	219
New Mexico.....	16	10,310.28	64	101,121.53	-----	-----	8	3,601
North Dakota.....	51	6,176.86	3	360.46	2	80.00	-----	26
Oklahoma.....	-----	-----	-----	-----	-----	-----	-----	60
Red River.....	-----	-----	-----	-----	-----	-----	17	9
Oregon.....	2	1,895.24	3	760.00	-----	-----	-----	30
South Dakota.....	1	79.04	-----	-----	-----	-----	-----	46
Utah.....	43	33,281.47	28	27,594.47	1	80.00	6	1,913
Washington.....	-----	-----	17	13,742.33	-----	-----	-----	28
Wyoming.....	35	14,718.98	18	17,694.30	2	80.00	329	3,298
	285	98,029.92	221	253,954.93	23	866.29	597	15,442

State	Sodium				Potash			
	Leases		Permits		Leases		Permits	
	Number	Acres	Number	Acres	Number	Acres	Number	Acres
Arizona.....	-----	-----	3	5,200.00	-----	-----	1	2,400.00
Do.....	-----	-----	-----	-----	-----	-----	5	9,040.00
California.....	-----	-----	5	5,995.96	4	7,783.80	1	2,559.58
Colorado.....	-----	-----	-----	-----	-----	-----	1	2,538.67
Idaho.....	-----	-----	2	3,254.11	-----	-----	-----	-----
Nevada.....	1	1,440.00	6	11,075.63	-----	-----	7	16,400.00
New Mexico.....	-----	-----	5	12,450.00	-----	-----	74	169,704.30
Do.....	-----	-----	-----	-----	-----	-----	1	2,560.00
Oregon.....	-----	-----	-----	-----	-----	-----	9	16,518.68
Utah.....	-----	-----	3	3,840.00	-----	-----	2	3,361.33
Do.....	-----	-----	1	1,245.00	-----	-----	1	1,760.00
Wyoming.....	-----	-----	-----	-----	-----	-----	-----	-----
	1	1,440.00	25	43,090.70	4	7,783.80	102	226,842.56

^a Includes 15 leases on naval petroleum reserves 1 and 2 under the act of Feb. 25, 1920, and 12 on naval petroleum reserves 1 and 2 under the act of June 4, 1920.

^b Oil and gas permits in Louisiana include the right to lease sulphur deposits discovered while prospecting for oil and gas.

^c Under the act of Oct. 2, 1917.

Also Idaho, 2 phosphate leases, 1,700 acres; Nevada, 1 phosphate lease, 160 acres; Oregon, 1 oil-shale lease, 2,680 acres. Total leases, 861; licenses, 23; permits 15,790; grand total, 16,704.

Coal produced from leases, licenses, and permits on public lands, in tons, by fiscal years

State	1912-1925	1926	1927	1928	1929	Total
Alaska.....	455,497.43	98,144.74	93,416.14	106,382.66	107,971.62	861,412.59
Alabama.....		10,056.00	22,854.00	43,523.00	109,832.00	186,265.00
California.....			3.00	3.00	36.00	42.00
Colorado.....	2,028,940.29	353,433.61	448,552.09	439,650.40	490,446.22	3,761,022.61
Idaho.....					466.65	466.65
Montana.....	252,973.58	198,602.15	278,896.48	278,886.33	299,813.84	1,309,172.38
Nevada.....				91.15		91.15
New Mexico.....	74,427.26	37,461.86	85,905.31	74,462.82	84,441.64	356,698.89
North Dakota.....	453,695.38	163,533.79	215,540.12	404,456.71	462,285.16	1,699,511.16
Oregon.....	688.97	628.88	423.58	1,280.03	3,234.47	6,255.93
South Dakota.....	1,842.63	1,074.00	531.11	422.68	342.45	4,212.87
Utah.....	487,303.62	172,433.36	282,564.80	432,707.96	580,100.78	1,955,110.52
Washington.....	164,280.43	16,910.29	30,974.32	33,723.99		245,889.03
Wyoming.....	4,465,885.23	962,490.51	1,053,037.36	1,184,657.65	1,022,860.90	8,688,931.65
	8,385,534.82	2,014,769.19	2,512,698.31	3,000,248.38	3,161,831.73	19,075,082.43

Sodium salts produced from public lands, in tons, by fiscal years

State	1921-1925	1926	1927	1928	1929	Total
California.....	3,145.30	430.09	5,911.35	15,377.99	22,906.47	47,771.20
Nevada.....	248.25	233.53	302.53	750.00	674.43	2,208.74
	3,393.55	663.62	6,213.88	16,127.99	23,580.90	49,979.94

Phosphate produced from public lands, in tons, by fiscal years

State	1921-1925	1926	1927	1928	1929	Total
Idaho.....	6,132.44	343.20	23,854.61	23,459.95	21,746.61	75,536.81
Nevada.....					45.45	45.45
	6,132.44	343.20	23,854.61	23,459.95	21,792.06	75,582.26

Productive leases, permits, and licenses, fiscal year 1929

	Coal		Potash	Sodium	Phos- phate	Oil and gas
	Shipping	Wagon				
Alaska.....	4	1				
Alabama.....	1					
California.....		1	2			69
Colorado.....	15	49				12
Idaho.....	0	3			1	
Louisiana.....						7
Montana.....	2	65				50
Nevada.....				1	1	
New Mexico.....	6	10				28
North Dakota.....	7	56				
Oklahoma.....						17
Oregon.....		2				
South Dakota.....		1				
Utah.....	17	16				8
Washington.....						
Wyoming.....	13	26				304
	65	230	2	1	2	495

ROYALTY, RENT, AND BONUSES

The following tables summarize accrued income from all mineral leases, licenses, and prospecting permits under the various leasing acts applicable to the public lands:

Royalties, rentals, and bonuses accrued from all mineral operations on public lands, by fiscal years

State	1912-1925	1926	1927	1928	1929	Total
Alabama.....	\$86,380.00	\$1,005.60	\$2,285.40	\$4,352.30	\$10,983.20	\$105,006.50
Alaska.....	35,142.42	9,227.63	11,327.50	19,495.19	13,162.60	88,355.34
California.....	4,676,746.55	1,259,912.83	966,228.53	1,356,050.49	677,743.16	8,936,681.56
Colorado.....	216,853.81	124,725.20	115,573.21	102,702.44	106,832.87	666,687.53
Idaho.....	1,111.38	695.00	2,549.41	2,529.85	2,385.14	9,270.78
Louisiana.....	1,508.59	1,670.12	15,993.32	3,829.21	10,723.06	33,724.30
Montana.....	891,278.79	355,254.89	172,765.63	107,964.87	110,554.70	1,637,818.88
Nevada.....	301.07	2,160.00	1,440.00	1,462.79	1,480.00	6,843.86
New Mexico.....	13,883.64	14,278.88	20,894.59	25,331.39	50,978.45	125,366.95
North Dakota.....	29,144.79	12,320.50	15,379.14	30,138.88	24,763.89	111,747.20
Oklahoma.....	-----	45,813.28	182,829.59	147,974.25	114,160.27	490,777.39
Oregon.....	952.15	972.80	1,048.00	948.00	1,187.10	5,108.05
South Dakota.....	399.60	227.34	40.86	43.32	80.00	791.12
Utah.....	138,932.03	87,282.79	71,864.60	79,144.70	112,271.36	489,495.48
Washington.....	22,215.91	1,721.04	3,096.57	3,495.22	-----	30,528.74
Wyoming.....	31,206,133.17	6,862,754.84	4,760,870.88	2,909,905.61	2,862,763.66	48,602,428.16
	37,320,983.90	8,780,022.74	6,344,187.23	4,795,368.51	4,100,069.46	61,340,631.84

Royalty and bonuses accrued from oil and gas operations on public lands

Total

Fiscal year	Royalty			Bonuses	Total
	Petroleum	Natural gas	Gasoline		
1921-1925.....	\$32,938,494.47	\$398,543.30	\$251,197.70	\$2,768,085.14	\$36,356,320.61
1926.....	7,951,665.52	93,508.29	154,265.43	250,503.94	8,449,943.18
1927.....	5,741,485.97	91,796.54	173,172.59	3,980.00	6,010,435.10
1928.....	3,519,810.55	108,570.86	107,070.00	672,500.00	4,407,951.41
1929.....	3,437,477.58	125,013.01	116,254.69	7,138.07	3,685,883.35
	53,588,934.09	817,432.00	801,960.41	3,702,207.15	58,910,533.65

1929, by States

California.....	\$642,073.06	\$6,030.46	\$17,641.31	-----	\$665,744.83
Colorado.....	45,702.15	1,484.14	96.27	-----	47,282.56
Louisiana.....	1,606.07	2,022.43	246.49	\$6,848.07	10,723.06
Montana.....	73,677.27	3,911.40	-----	-----	77,588.67
New Mexico.....	30,022.84	6,943.49	125.54	-----	37,091.87
Oklahoma.....	107,752.03	-----	6,408.24	-----	114,160.27
Utah.....	305.84	6,071.62	-----	-----	6,377.46
Wyoming.....	2,536,338.32	98,549.47	91,736.04	290.00	2,726,914.63

Rent, royalty, and bonuses accrued from mining operations on public lands

	Coal	Sodium	Phosphate	Potash	Bonuses	Total
1929						
Alabama.....	\$10,983.20					\$10,983.20
Alaska.....	13,162.60					13,162.60
California.....	9.00			\$11,989.33		11,998.33
Colorado.....	59,250.31				\$300.00	59,550.31
Idaho.....	116.66		\$2,268.48			2,385.14
Montana.....	32,966.03					32,966.03
Nevada.....		\$1,440.00	40.00			1,480.00
New Mexico.....	13,886.58					13,886.58
North Dakota.....	24,579.89				184.00	24,763.89
Oregon.....	1,187.10					1,187.10
South Dakota.....	80.00					80.00
Utah.....	105,893.90					105,893.90
Wyoming.....	135,849.03					135,849.03
	397,964.30	1,440.00	2,308.48	11,989.33	484.00	414,186.11
SUMMARY						
1912-1925.....	790,408.19	301.07	1,111.38	24,458.65	148,384.00	964,663.29
1926.....	319,626.78	2,160.00	695.00	6,031.78	1,566.00	330,079.56
1927.....	322,308.12	1,440.00	2,549.41	6,217.60	1,237.00	333,752.13
1928.....	372,949.85	1,440.00	2,529.85	9,402.40	1,095.00	387,417.10
1929.....	397,964.30	1,440.00	2,308.48	11,989.33	484.00	414,186.11
	2,203,257.24	6,781.07	9,194.12	58,099.76	152,766.00	2,430,098.19

ACTIVITIES ON NAVAL PETROLEUM RESERVES

On March 17, 1927, by Executive order, the administration of all naval petroleum reserves was vested in the Department of the Navy. Pursuant to a cooperative agreement engineering supervision was continued by the Geological Survey under the direction of the Secretary of the Navy.

Statistics of the production of petroleum, natural gas, and natural-gas gasoline from naval petroleum reserves are summarized as follows:

*Royalty accrued from naval petroleum reserves***By States**

State	Petroleum	Natural gas	Gasoline	Total
California:				
1921-1925.....	\$10,127,293.96	\$287,996.12	\$231,447.70	\$10,646,737.78
1926.....	3,187,461.22	100,089.27	151,296.95	3,438,847.44
1927.....	3,094,331.59	90,475.99	163,760.36	3,348,567.94
1928.....	1,909,711.11	125,866.88	162,834.08	2,198,412.07
1929.....	1,583,072.32	82,685.76	151,706.37	1,817,464.45
	19,901,870.20	687,114.02	861,045.46	21,450,029.68
Wyoming:				
1923-1927.....	763,114.40	44,765.64	7,104.55	814,984.59
1928.....	24,169.70	7,952.86	1,840.76	33,963.32
1929.....				
	787,284.10	52,718.50	8,945.31	848,947.91

Total

1921-1925.....	\$10,685,660.38	\$298,874.65	\$231,485.45	\$11,216,020.48
1926.....	3,310,658.54	114,247.75	152,480.36	3,577,386.65
1927.....	3,175,882.25	110,204.62	169,643.75	3,455,730.62
1928.....	1,933,880.81	133,819.74	164,674.84	2,232,375.39
1929.....	1,583,072.32	82,685.76	151,706.37	1,817,464.45
	20,689,154.30	739,832.52	869,990.77	22,298,977.59

Oil and gas leases in Oklahoma exclusive of the Osage Reservation

Agency	Leases			Wells		Total royalty and rentals
	Nonproducing	Producing	Total	Producing	Being drilled	
Five Civilized Tribes:						
Cherokee.....		387				
Choctaw.....		62				
Creek.....	7,022	626	8,239	5,416	85	
Chickasaw.....		18				
Seminole.....		124				
	7,022	1,217	8,239	5,416	85	\$5,646, 586. 52
Kiowa Indian Agency:						
Kiowa.....	162	0	162	0	0	
Comanche.....	309	19	328	23	1	
Apache.....	9	6	15	16	0	
Wichita.....	38	0	38	0	0	
Caddo.....	131	0	131	0	0	
	649	25	674	39	1	150, 540. 30
Pawnee Indian Agency:						
Ponca.....	195	14	209	58	0	
Otoe.....	232	2	234	2	1	
Tonkawa.....	21	0	21	0	0	
Pawnee.....	201	20	221	56	1	
Kaw.....	49	4	53	33	0	
	698	40	738	149	2	224, 580. 61
Shawnee Indian Agency:						
Iowa.....	30	0	30	0	0	
Kikapoo.....	84	0	84	0	0	
Pottawatomie.....	67	6	73	23	3	
Sac and Fox.....	176	9	185	24	1	
Shawnee.....	212	0	212	0	0	
	569	15	584	47	4	278, 148. 23
Cheyenne and Arapaho Indian Agency:	296	0	296	0	0	92, 095. 33
Grand total.....	9, 234	1, 297	10, 531	5, 651	92	6, 391, 950. 99

Outside Oklahoma supervision was exercised over oil and gas leases on tribal and restricted allotted Indian lands as follows:

Oil and gas leases on Indian lands outside Oklahoma

State and tribe	Being tested	Producing	Nonproducing	Under supervision
Colorado:				
Ute tribal.....	5	3	4	7
Montana:				
Blackfeet tribal.....	1	0	3	3
Blackfeet allotted.....	0	0	• 10	• 10
Crow tribal.....	4	1	6	7
Crow allotted.....	9	2	95	97
New Mexico:				
Navajo tribal.....	3	3	9	12
Navajo, Executive order.....	2	0	2	2
Navajo allotted.....	0	0	43	43
Utah:				
Navajo, Executive order.....	1	0	1	1
Wyoming:				
Shoshone tribal.....	1	13	48	61
Shoshone allotted.....	3	8	5	13
	29	30	226	256

• Awaiting final execution.

*Petroleum, natural gas, and natural-gas gasoline produced from public lands***Total**

Fiscal year	Petroleum	Natural gas	Gasoline
	<i>Barrels</i>	<i>M cubic feet</i>	<i>Gallons</i>
1921-1925.....	118,333,954.01	60,298,796.00	63,997,718.97
1926.....	29,712,876.16	18,535,880.50	35,910,791.54
1927.....	25,648,101.43	17,723,410.03	40,104,404.57
1928.....	23,370,549.38	18,922,026.00	39,698,292.82
1929.....	22,458,842.62	22,770,394.11	47,319,874.32
	219,524,323.60	138,250,506.64	227,031,082.22

1929, by States

California.....	5,790,220.07	1,208,043.11	8,199,733.80
Colorado.....	962,170.29	64,360.00	73,522.00
Louisiana.....	7,823.92	759,719.00	54,248.60
Montana.....	617,051.45	1,082,999.00	-----
New Mexico.....	158,202.44	273,924.00	3,792.00
Oklahoma.....	465,086.76	-----	1,528,001.92
Utah.....	2,953.13	1,004,659.00	-----
Wyoming.....	14,455,334.56	18,396,690.00	37,460,576.00

*Petroleum, natural gas, and gasoline produced from naval reserves***By States**

	Petroleum	Natural gas	Gasoline
	<i>Barrels</i>	<i>M cubic feet</i>	<i>Gallons</i>
California:			
1921-1925.....	37,882,945.09	35,544,349.81	34,508,751.07
1926.....	12,234,702.16	12,917,255.09	19,851,232.68
1927.....	12,368,315.70	12,328,208.69	24,052,402.12
1928.....	9,690,573.93	9,077,966.68	24,797,263.61
1929.....	8,116,635.98	7,711,858.00	24,908,262.82
	80,293,172.86	77,579,638.27	128,117,962.30
Wyoming:			
1923-1925.....	2,523,213.05	950,520.00	7,829.00
1926.....	520,680.00	1,458,032.00	291,852.00
1927.....	357,049.32	1,958,463.00	1,441,036.00
1928.....	149,285.26	795,854.00	743,179.00
	3,550,227.63	5,162,869.00	2,483,896.00

Total

1921-1925.....	40,406,158.14	36,494,869.81	34,516,580.07
1926.....	12,755,382.16	14,375,287.09	20,143,134.68
1927.....	12,725,365.02	14,286,671.69	25,493,438.12
1928.....	9,839,859.19	9,873,820.68	25,540,442.61
1929.....	8,116,635.98	7,711,858.00	24,908,262.82
	83,843,400.49	82,742,507.27	130,601,858.30

Production from naval petroleum reserve No. 3, in Wyoming, was definitely suspended in January, 1928. Supervision on this reserve for the present is confined to observation of gas pressure and consultation with the Navy Department.

*Producing oil and gas fields, with dates defined and net acreage outstanding
June 30, 1929, in accordance with the act of February 25, 1920*

California:		Acres
Buena Vista Hills field, Aug. 11, 1920, May 18, 1925, Aug. 15, 1923, Feb. 11, 1924, Mar. 26, 1925, June 12, 1925	32,282	
Coalinga east side field, July 20, 1920	9,760	
Coalinga west side field, July 20, 1920	15,002	
Elk Hills field, Aug. 11, 1920, Nov. 19, 1923	38,902	
Kern River field, July 15, 1920	34,866	
Lost Hills field, July 20, 1920	4,206	
McKittrick field, Aug. 11, 1920, May 18, 1923, Oct. 6, 1924	6,376	
McKittrick front field, Aug. 11, 1920	4,882	
Midway field, Aug. 17, 1920, May 18, 1923	26,536	
Sunset field, Aug. 11, 1920	12,183	
Wheeler Ridge field, March 25, 1925	880	
Colorado:		
Garmesa field, Mar. 30, 1925	4,672	
Hamilton Dome, Feb. 19, 1924	4,357	
North McCallum field, Mar. 17, 1927	3,081	
Wellington anticline, Jan. 28, 1924	4,365	
White River Dome, Dec. 19, 1922 (13,208 acres canceled Apr. 13, 1926).		
Williams Park anticline, May 17, 1923	4,266	
Montana:		
Baker field, Jan. 5, 1922	5,629	
Cat Creek field, Apr. 2, 1920, Apr. 4, 1921, June 21, 1927	2,918	
Elk Basin field Dec. 16, 1924	581	
(Additional acreage, same field, in Wyoming, 2,319.)		
Gas City field, Jan. 5, 1922	1,275	
Gas Ridge field, Dec. 9, 1922, Apr. 20, 1926	16,587	
Kevin-Sunburst field, Dec. 9, 1922, Apr. 20, 1926	47,691	
Shelby field, Dec. 9, 1922, Apr. 20, 1926	23,906	
New Mexico:		
Artesia field, Nov. 6, 14, 1925	21,533	
Aztec field, Jan. 9, 1924	1,600	
Oklahoma:		
East Red River oil field, Aug. 22, 1924 (156 acres canceled Feb. 3, 1927).		
Middle Red River oil field, Aug. 22, 1924, Oct. 3, 1924, Feb. 3, 1927, Oct. 18, 1928	418	
West Red River oil field, Aug. 22, 1924, Feb. 3, 1927	403	
Utah:		
Ashley Creek field, Oct. 14, 1927	1,240	
Cisco Dome, Feb. 25, 1925	13,515	
Virgin oil field, Aug. 30, 1924	520	
Woodside field, May 19, 1924, Jan. 27, 1926	12,375	
Wyoming:		
Alkali Butte field, Dec. 1, 1923	399	
Big Muddy field, Aug. 20, 1920	6,427	
Big Polecat field, Apr. 2, 1923	1,697	
Big Sand Draw field, Apr. 2, 1920, Aug. 24, 1928	4,830	
Billy Creek Field, Feb. 8, 1924	3,560	
Black Mountain anticline, Mar. 30, 1925	2,865	
Bolton Creek field, Nov. 30, 1921	720	
Boone Dome, Feb. 4, 1924	2,320	
Buffalo Basin field, Aug. 18, 1920	7,922	
Byron field, July 20, 1920	224.35	
Derby Dome, Dec. 19, 1922	926	
Dry Piney field, Apr. 2, 1920 (2,559 acres canceled Nov. 25, 1924).		
East Ferris Dome, Apr. 7, 1926	876	
East Warm Springs field, Nov. 10, 1924	312	
Elk Basin field, Dec. 16, 30, 1924, Mar. 16, 1927	2,319	
(Additional acreage, same field, in Montana, 581.)		
Elk Butte field, July 15, 1920	2,002	
Garland field, July 20, 1920	587.94	
Grass Creek field, Aug. 18, 1920	3,067	

Wyoming—Continued.

	Acres
Greybull field, Apr. 26, 1921.....	95, 93
Hamilton Dome, Apr. 5, 1920.....	11, 087
Hatfield Dome, Sept. 21, 1925.....	1, 676
Hidden Dome, Apr. 20, 1922.....	1, 067
Iron Creek field, Sept. 17, 1920.....	920
Lamb anticline, Mar. 12, 1925.....	1, 944
Lance Creek field, Apr. 2, 1920.....	10, 736
Little Grass Creek field, Sept. 19, 1921.....	1, 240
Little Polecat field, Apr. 2, 1923.....	1, 076
Lost Soldier field, July 28, 1927.....	960
Mahoney Dome, Dec. 15, 1920, Aug. 11, 1921, Sept. 21, 1925.....	8, 229
Middle Baxter Basin field, Apr. 27, 1925.....	1, 800
Mule Creek field, Apr. 5, 1920.....	1, 527
North Baxter Basin field, Apr. 27, 1925.....	2, 716
Notches Dome, Dec. 13, 1923.....	960
Osage field, Aug. 25, 1920, Oct. 5, 1920.....	15, 224
Poison Spider field, Sept. 17, 1920.....	5, 359
Rex Dome, Sept. 21, 1925.....	1, 360
Rock Creek field, Apr. 2, 1920.....	4, 354
Salt Creek field, Apr. 2, 1920.....	34, 398
South Baxter Basin field, Apr. 27, 1925.....	3, 120
South Sunshine field, Aug. 4, 1927.....	2, 702
Thornton field, Apr. 5, 1920.....	1, 274
Torchlight Dome, Oct. 30, 1920, Oct. 26, 1923.....	1, 004
Wertz Dome, Dec. 15, 1920, Feb. 25, 1927.....	1, 009
West Ferris Dome, Apr. 7, 9, 1926.....	720
West Warm Springs field, Nov. 10, 1924.....	80
Wiley anticline, July 20, 1920.....	879

New wells and wells shut in in major oil-producing public-land States

State	Number of wells completed to production on public lands			Number of wells completed to production on all lands			Number of wells shut in on public lands as of Mar. 12, 1929	Number of wells shut in on all lands as of Mar. 12, 1929	Number of oil and gas permits outstanding as of Jan. 1, 1927	Number of oil and gas permits under supervision as of Mar. 1, 1929
	1927	1928	Jan. 1-July 1, 1929	1927	1928	Jan. 1-July 1, 1929				
Wyoming.....	179	91	21	249	138	32	159	417	4, 581	4, 049
Utah.....	7	6	1	18	10	7	6	15	3, 969	3, 014
Idaho.....	0	0	0	1	0	0	0	3	179	363
Colorado.....	9	5	2	34	55	10	4	8	2, 811	2, 696
Montana.....	22	21	9	270	283	86	22	95	3, 012	1, 672
New Mexico.....	16	11	11	31	19	15	5	17	3, 092	4, 184
California.....	67	50	21	877	688	462	270	3, 560	2, 664	1, 453
Total.....	300	184	65	1, 480	1, 193	612	466	4, 115	20, 308	17, 431

NOTE.—Naval reserves not included.

Applications received, acted on, and pending under the mineral leasing acts, fiscal year 1929

Mineral	Prospecting permits			Leases		
	Received	Acted on	Pending	Received	Acted on	Pending
Oil and gas.....	3, 945	3, 932	13	.....	.....	.....
Coal.....	116	104	12	99	89	10
Phosphate.....	.....	.....	.....	2	1	1
Sodium.....	35	30	5	7	6	1
Potassium.....	35	27	8	5	5	.....
Oil shale.....	.....	.....	.....	1	1	.....
Total.....	4, 131	4, 003	38	114	102	12

Annual production of electricity by public-utility power plants in the United States, 1919-1928

Year	Total		Water power			Fuel power		
	Kilowatt-hours	Change from preceding year	Kilowatt-hours	Per cent of total	Change from preceding year	Kilowatt-hours	Per cent of total	Change from preceding year
		<i>Per cent</i>			<i>Per cent</i>			<i>Per cent</i>
1919.....	38,921,000,000	-----	14,606,000,000	37.5	-----	24,315,000,000	62.5	-----
1920.....	43,555,000,000	+11.9	16,150,000,000	37.1	+10.6	27,405,000,000	62.9	+12.7
1921.....	40,975,000,000	-5.9	14,970,000,000	36.5	-7.3	26,005,000,000	63.5	-5.1
1922.....	47,654,000,000	+16.3	17,207,000,000	36.1	+14.9	30,447,000,000	63.9	+17.1
1923.....	55,665,000,000	+16.8	19,343,000,000	34.8	+12.4	36,322,000,000	65.2	+19.3
1924.....	59,014,000,000	+6.0	19,969,000,000	33.8	+3.2	39,044,000,000	66.2	+7.5
1925.....	65,870,000,000	+11.6	22,356,000,000	33.9	+11.9	43,514,000,000	66.1	+11.4
1926.....	73,791,000,000	+12.0	26,189,000,000	35.5	+17.1	47,602,000,000	64.5	+9.4
1927.....	80,205,000,000	+8.7	29,875,000,000	37.2	+14.1	50,330,000,000	62.8	+5.7
1928.....	87,850,000,000	+9.5	34,696,000,000	39.5	+16.1	53,154,000,000	60.5	+5.6

Annual consumption of fuel in the production of electricity by public-utility power plants in the United States, 1919-1928

Year	Coal		Fuel oil		Gas	
	Short tons	Change from preceding year	Barrels	Change from preceding year	M cubic feet	Change from preceding year
		<i>Per cent</i>		<i>Per cent</i>		<i>Per cent</i>
1919.....	35,100,000	-----	11,050,000	-----	21,406,000	-----
1920.....	37,124,000	+5.8	13,123,000	+18.8	24,702,000	+15.4
1921.....	31,585,000	-14.9	12,045,000	-8.2	23,722,000	-4.0
1922.....	34,179,000	+8.2	13,197,000	+9.6	27,172,000	+14.5
1923.....	38,966,000	+14.0	14,684,000	+11.3	31,483,000	+15.9
1924.....	37,556,000	-3.6	16,630,000	+13.3	48,443,000	+53.9
1925.....	40,222,000	+7.1	10,246,000	-38.4	46,521,000	-4.0
1926.....	41,311,000	+2.7	9,399,000	-8.3	53,207,000	+14.4
1927.....	41,888,000	+1.4	6,782,000	-27.8	62,919,000	+18.3
1928.....	41,350,000	-1.3	7,158,000	+5.5	77,326,000	+22.9

The remarkable improvement each year in the utilization of fuel in the generation of electricity by public-utility companies continues, as indicated in the following table:

Average consumption of coal^a per kilowatt-hour by public-utility power plants in the United States, 1919-1928

Year	Pounds	Per cent of rate in 1919	Year	Pounds	Per cent of rate in 1919
1919.....	3.2	100	1924.....	2.2	69
1920.....	3.0	94	1925.....	2.1	66
1921.....	2.7	84	1926.....	1.95	61
1922.....	2.5	78	1927.....	1.84	57
1923.....	2.4	75	1928.....	1.76	55

^a Oil and gas included as equivalent coal.

PUBLIC DOMAIN: REVENUE TO THE STATES

Distribution of receipts of General Land Office, 1929

Source of receipts	Disposition in the Treasury			
	General fund	Reclamation fund	State funds	Total
Sales of public lands.....	\$46,304.12	\$255,598.08	\$10,242.25	\$312,144.45
Fees and commissions.....	96,856.69	365,094.11		461,950.80
Bonuses, rentals, and royalties from mineral leases.....	431,054.94	2,038,805.94	1,456,289.95	3,926,150.83
Sales of land and timber in Oregon and California railroad grant.....	104,018.88		¹ 580,000.00	684,018.88
Sales of land and timber in Coos Bay wagon-road grant.....	131,151.16		² 43,717.05	174,868.21
Sales of reclamation town sites and camp sites.....		8,152.44		8,152.44
Sales of timber in Alaska.....	7,464.28			7,464.28
Royalties on coal leases in Alaska.....	6,661.80			6,661.80
Rentals from fur farms in Alaska.....	1,280.00			1,280.00
Royalties and rentals from potash deposits.....		11,448.75		11,448.75
Power permits.....	12,302.16			12,302.16
Miscellaneous (copies of records, survey fees, sales of Government property, etc.).....	47,992.40			47,992.40
Total.....	885,086.43	2,679,099.32	2,090,249.25	5,654,435.00
Sales and leases of Indian lands.....				³ 539,531.33
Aggregate.....				6,193,966.33

¹ Estimated amount to be paid certain counties in the State of Oregon in lieu of taxes.

² Amount payable to Coos County as 25 per cent of proceeds of sales of lands and timber.

³ Of the amount received as royalty from oil lands in the bed of the Red River, Okla., 37½ per cent, amounting to \$41,784.58, is paid to the State of Oklahoma, and the balance, amounting to \$69,640.98, is credited to Kiowa, Comanche, and Apache Indians.

Amounts accrued and paid to States for purposes of education or of making public roads and improvements on account of grants 2, 3, and 5 per cent of net proceeds of sales of public lands lying within said States

State	Total to June 30, 1927	Fiscal year, 1928	Aggregate to June 30, 1928, inclusive
Alabama.....	\$1,082,414.54	\$173.07	\$1,082,587.61
Arizona.....	41,529.07	846.48	42,375.55
Arkansas.....	339,145.50	244.54	339,390.04
California.....	1,171,648.24	2,069.32	1,173,717.56
Colorado.....	520,322.60	719.11	521,041.71
Florida.....	144,939.56		144,939.56
Idaho.....	303,414.19	937.90	304,352.09
Illinois.....	1,187,908.89		1,187,908.89
Indiana.....	1,040,255.26		1,040,255.26
Iowa.....	633,638.10		633,638.10
Kansas.....	1,127,987.59		1,127,987.59
Louisiana.....	470,261.09	104.51	470,365.60
Michigan.....	589,369.46	579.09	589,948.55
Minnesota.....	595,423.74	57.77	595,481.51
Mississippi.....	1,072,805.44	140.57	1,072,946.01
Missouri.....	1,061,105.54		1,061,105.54
Montana.....	582,299.83	842.39	583,142.22
Nebraska.....	574,626.40	5.55	574,631.95
Nevada.....	48,844.67	429.37	49,274.04
New Mexico.....	148,871.68	579.70	149,451.38
North Dakota.....	539,067.07	113.43	539,180.50
Ohio.....	999,353.01		999,353.01
Oklahoma.....	66,631.78	24.82	66,656.60
Oregon.....	761,604.32	1,882.99	763,487.31
South Dakota.....	348,588.18	34.03	348,622.26
Utah.....	173,363.08	2,323.32	175,686.40
Washington.....	435,638.37	156.63	435,795.00
Wisconsin.....	586,645.26	547.05	587,192.31
Wyoming.....	315,695.82	811.84	316,507.66
Total.....	16,963,398.28	13,623.53	16,977,021.81

Amounts covered into the Treasury to the credit of the reclamation fund from sales of public lands and fees and commissions in the several States, under the act of June 17, 1902 (32 Stat. 388)

State	Fiscal years 1901 to 1927	1928	Total for 28 years ended June 30, 1928
Arizona.....	\$2,306,023.89	\$50,755.13	\$2,356,779.02
California.....	7,690,532.48	94,255.09	7,784,787.57
Colorado.....	9,921,458.08	72,911.91	9,994,369.99
Idaho.....	6,801,706.00	37,339.75	6,839,045.75
Kansas.....	1,032,005.82		1,032,005.82
Montana.....	14,933,230.39	68,652.81	15,001,883.20
Nebraska.....	2,087,502.39	1,697.08	2,089,199.47
Nevada.....	951,818.56	16,876.65	968,695.21
New Mexico.....	5,997,367.03	98,018.46	6,095,385.49
North Dakota.....	12,181,584.51	3,010.74	12,184,595.25
Oklahoma.....	5,923,257.43	471.57	5,923,729.00
Oregon.....	11,764,394.51	56,480.52	11,820,875.03
South Dakota.....	7,716,552.66	5,076.22	7,721,628.88
Utah.....	3,975,641.38	77,316.03	4,052,957.41
Washington.....	7,340,204.62	5,992.75	7,346,197.37
Wyoming.....	7,944,965.38	100,722.68	8,045,688.06
Total.....	108,568,245.13	689,577.39	109,257,822.52

Payments to States from receipts under the mineral leasing act of February 25, 1920, from the passage of the act to June 30, 1929

State	1921-1925	1926	1927	1928	1929	Total
Alabama.....	\$32,392.50	\$345.00	\$586.76	\$1,138.54	\$3,306.75	\$37,769.55
California.....	2,378,512.53	433,475.44	445,601.48	521,319.18	241,031.71	4,019,940.34
Colorado.....	49,060.43	31,531.94	40,867.46	34,918.75	36,816.11	193,194.69
Idaho.....	140.08	370.36	736.19	930.90	1,123.39	3,300.92
Louisiana.....	1,506.25	350.06	5,330.94	1,461.61	4,544.40	13,193.26
Montana.....	356,412.67	98,482.97	70,832.76	44,651.39	42,445.49	612,825.28
Nevada.....	270.00	561.43	540.00	548.64	273.75	2,193.82
New Mexico.....	4,252.40	6,539.01	5,771.91	9,688.23	16,977.45	43,229.00
North Dakota.....	9,357.68	3,453.05	2,904.18	12,277.55	11,404.23	39,396.69
South Dakota.....	108.93	94.37	7.06	15.00	15.00	240.36
Utah.....	49,748.94	12,311.93	12,905.95	21,705.52	33,332.48	130,004.82
Washington.....	6,586.84	637.12	939.11	1,491.32	169.33	9,823.72
Wyoming.....	12,120,637.66	2,584,388.31	1,911,665.78	1,102,534.13	996,590.99	18,715,816.87
Total.....	15,008,986.91	3,172,540.99	2,498,689.58	1,752,680.76	1,388,031.08	23,820,929.32

Receipts under the mineral leasing act of February 25, 1920, from the passage of the act to June 30, 1929

State	1921-1925	1926	1927	1928	1929	Total
Alabama.....	\$86,380.00	\$920.00	\$1,564.70	\$3,036.10	\$8,818.00	\$100,718.80
California.....	13,657,152.02	1,092,492.65	1,194,085.61	1,389,800.40	644,191.22	17,977,721.90
Colorado.....	131,202.94	94,418.49	109,046.73	96,839.41	101,903.42	533,410.99
Idaho.....	373.54	923.62	1,963.16	2,482.41	2,995.71	8,738.44
Louisiana.....	4,067.45	882.73	14,215.85	3,897.63	12,118.40	35,182.06
Montana.....	911,791.69	249,690.59	188,897.36	119,070.36	113,187.96	1,582,637.96
Nevada.....	720.00	1,497.15	1,440.00	1,463.05	730.00	5,850.20
New Mexico.....	11,339.70	17,437.35	15,391.77	25,835.27	45,273.20	115,277.29
North Dakota.....	25,911.46	8,630.37	7,744.47	32,740.14	30,411.28	105,437.72
South Dakota.....	290.47	251.66	18.83	40.00	40.00	640.96
Utah.....	132,017.02	32,749.62	34,870.58	58,081.38	88,886.62	346,605.22
Washington.....	17,221.42	1,698.98	2,504.28	3,976.86	451.55	25,853.09
Wyoming.....	33,037,562.68	6,883,125.55	5,097,775.42	2,940,091.00	2,835,871.32	50,794,425.97
Total.....	48,016,030.39	8,384,718.76	6,669,518.76	4,677,354.01	3,884,878.68	71,632,500.60

Class, number, and area of patents issued during fiscal year ended June 30, 1929

Class	Num- ber	Acres	Class	Num- ber	Acres
Abandoned military reserva- tion.....	39	6,691.55	Private land claim.....	32	17,780.33
Agricultural college scrip.....	1	(¹)	Public sale.....	370	29,653.03
Cemetery site.....	3	120.64	Railroad.....	39	230,106.97
Coal deposits.....	1	(²)	Railroad lieu.....	11	746.66
Commuted homesteads.....	157	13,634.45	Reclamation homestead.....	181	13,489.29
Desert land.....	302	49,956.62	Reclamation desert land.....	1	120.00
Desert land segregation.....	4	2,264.50	Reissue.....	526	(²)
Forest exchange.....	53	56,630.19	Sioux half-breed scrip.....	4	440.49
Forest homesteads.....	171	16,999.90	Small holding claim.....	16	219.18
Forest lieu.....	39	6,311.61	Soldiers' additional.....	64	2,856.66
Homesteads, final.....	1,583	190,068.93	Special act.....	97	25,055.66
Homesteads, enlarged.....	1,229	305,368.39	Supplemental (act Apr. 14, 1914).....	1	(²)
Homesteads, stock raising.....	3,271	1,350,384.64	Swamp.....	34	12,836.72
Indian fee.....	1,208	(²)	Timber culture.....	9	1,281.59
Indian homestead, act July 4, 1884.....	1	80.00	Timber and stone.....	140	11,709.20
Indian homestead reservation.....	24	2,828.04	Timber sales.....	119	(²)
Indian trust.....	862	92,896.34	To complete record.....	153	(²)
Military bounty land warrant.....	7	519.30	Town lots.....	588	366.42
Mineral.....	359	46,931.17	Valentine scrip.....	9	326.07
Miscellaneous cash.....	57	5,972.93			
				11,765	2,494,647.47

Acres

Patented area under the Kinkaid Act.....	1,480
Patented area under coal reserved.....	69,606
Patented area under act July 17, 1914 (oil, gas, phosphate, etc., reserved).....	59,958

¹ Supplemental; no area reported.² Patented area not included in above report:

Indian fee.....	177,644
Timber sales.....	13,037
Coal deposits.....	80
Under act Apr. 14, 1914.....	40
Reissues.....	65,971

³ No area to be reported.



PUBLIC DOMAIN: ACTIVITIES OF THE GEOLOGICAL SURVEY

Classification of expenditures by the United States Geological Survey pertaining to the fiscal year ended June 30, 1929

Object of expenditure	Geological Survey salaries	Topographic surveys	Geologic surveys	Volcanologic surveys	Alaskan mineral resources	Gaging streams	Classification of lands	Geologic and topographic maps of the United States	Preparation of illustrations	Mineral leasing	Total
Personal services	\$134,889.86	\$725,200.72	\$326,817.65	\$17,686.61	\$49,805.42	\$536,716.89	\$149,493.26	\$194,725.21	\$25,427.17	\$280,886.83	\$2,441,649.62
Stationery and office supplies	-----	11,304.69	978.07	158.06	116.21	2,069.28	272.76	28,259.38	-----	2,588.01	46,651.46
Scientific and educational supplies	-----	247.13	1,289.67	12.72	17.00	156.74	214.15	-----	-----	108.34	2,055.75
Sundry supplies	-----	5,574.16	865.11	188.43	372.07	3,171.12	234.55	6,549.17	3.02	727.16	17,684.79
Subsistence and care of animals and storage and care of vehicles	-----	1,793.01	695.51	-----	-----	33.00	81.33	-----	-----	26.00	2,628.85
Telephone service	-----	1,006.36	238.03	7.53	35.65	918.69	61.13	1.56	.25	738.74	3,007.94
Telegraph service	-----	240.39	103.70	19.90	9.70	1,080.55	58.55	-----	-----	2,527.92	4,040.71
Other communication service	-----	26.90	-----	.45	-----	20.25	-----	-----	-----	142.30	152.90
Travel expenses	-----	113,164.73	27,037.96	271.82	8,084.30	93,838.67	15,352.26	-----	2.88	19,577.52	277,330.14
Attendance at meetings	-----	96.96	825.16	-----	38.61	300.68	23.78	-----	-----	-----	1,285.13
Hire, maintenance, operation, and repair of horse-drawn and motor-propelled passenger-carrying vehicles	-----	962.95	2,854.44	328.26	-----	12,998.39	5,758.66	-----	-----	20,019.21	42,921.91
Transportation of things	-----	48,008.15	7,173.91	163.41	3,774.14	20,790.53	3,631.84	140.77	1.04	1,785.24	85,469.03
Lithographing, engraving, and engraving	-----	10,795.69	527.31	-----	332.11	957.35	1,809.95	-----	256.13	201.43	14,879.97
Stenographic work, typewriting, and duplicating work, etc. (job work)	-----	-----	-----	-----	-----	81.00	2.00	-----	-----	.25	83.25
Photographing and making photographs and prints	-----	3,245.95	3,122.26	66.48	2,094.30	1,059.14	1,250.81	129.69	370.83	497.71	11,846.17
Heat, light, power, water, and electricity	-----	8.33	81.29	32.00	20.08	-----	-----	4,378.33	-----	4,520.03	4,520.03
Rents	-----	153.60	4.00	-----	-----	2,752.20	-----	7,886.94	-----	10,796.74	10,796.74
Repairs and alterations	-----	303.93	859.02	57.60	24.15	1,531.55	215.34	728.40	-----	28,111.90	31,831.89
Special and miscellaneous current expenses	-----	30,294.25	1,141.83	-----	194.87	1,097.14	167.75	341.17	-----	1,512.51	34,749.52
Purchase of passenger-carrying vehicles	-----	-----	1,149.30	538.00	-----	6,856.68	3,417.00	-----	-----	5,030.40	16,991.38
Furniture, furnishings, and fixtures	-----	1,430.16	215.10	-----	592.59	3,247.11	632.23	1,105.88	-----	3,526.60	10,749.67
Educational and scientific equipment	-----	40,678.68	11,187.19	662.21	1,844.32	66,257.69	2,877.94	1,594.59	6.11	1,627.80	126,736.53
Livestock	-----	125.80	-----	-----	-----	-----	90.00	-----	-----	-----	215.80
Other equipment	-----	39,708.60	6,333.47	512.05	203.49	73,300.94	3,518.49	9,396.44	-----	783.31	133,762.79
Miscellaneous transfers and adjustments	-----	20,494.15	2,163.58	-----	718.46	39,296.80	1,599.57	107.91	28.32	3,228.65	67,637.44
	134,889.86	1,054,870.29	395,673.50	20,705.53	68,277.47	869,432.39	190,763.35	243,080.17	26,104.75	385,919.10	3,389,716.41

Amounts appropriated for, transferred to, and expended by the United States Geological Survey pertaining to the fiscal year ended June 30, 1929 *

	Funds available			Expenditures			Balance	
	Amount of appropriation	Repayments on account of work performed		Total	Disbursements	Outstanding liabilities		Total
		Made	To be made					
APPROPRIATIONS								
Salaries.....	\$135,500.00			\$135,500.00	\$134,889.86		\$610.14	
Topographic surveys.....	559,000.00	\$818,482.45	\$55,208.49	932,690.94	917,637.93	\$13,141.36	1,911.65	
Geologic surveys.....	355,000.00	25,401.31	3,565.98	383,967.29	375,506.20	7,662.70	798.39	
Volcanologic surveys.....	21,000.00			21,000.00	18,954.65	1,750.88	294.47	
Alaskan mineral resources.....	67,500.00			67,500.00	57,390.64	9,765.20	67,155.84	
Gaging streams.....	270,800.00	413,051.77	25,299.39	708,851.16	693,551.82	12,294.25	3,005.09	
Classification of lands.....	191,500.00	1,283.44	75.35	192,858.79	185,236.37	5,526.98	2,095.44	
Geologic and topographic maps of the United States.....	110,000.00	110,708.27	23,627.48	244,335.75	227,140.54	15,939.63	1,253.68	
Preparation of illustrations.....	26,480.00	60.43		26,540.43	26,101.87	2.88	435.68	
Mineral leasing.....	246,000.00	1,593.83		247,593.83	240,090.41	4,665.89	2,837.53	
Great Smoky Mountains National Park in North Carolina and Tennessee, 1928-29.....	65,000.00	53.32		65,053.32	64,860.98	181.43	10.91	
Shenandoah National Park in Virginia, 1928-29.....	35,000.00	2,851.16		37,851.16	37,827.88	18.53	37,846.41	
U. S. Geological Survey, 1927-1929 (mineral leasing).....	20,000.00			20,000.00		14,850.00	5,150.00	
U. S. Geological Survey, 1926-1929 (oil, gas, and oil shale).....	20,000.00			20,000.00	574.70	10,179.70	9,250.30	
Shenandoah National Park in Virginia, 1929-30.....	11,075.22			11,075.22	11,030.08	45.14	11,075.22	
Great Smoky Mountains National Park in North Carolina and Tennessee, 1929-30.....	2,054.16	6,072.80		8,126.96	7,435.97	690.99	8,126.96	
	\$2,135,609.38	\$79,719.90	107,776.69	3,123,105.97	2,998,229.90	96,710.86	28,165.21	
TRANSFERS								
Engineering, Bureau of Engineering (Navy Department, act Mar. 7, 1928), 1929.....	43,000.00			43,000.00	42,445.47		554.53	
Federal Power Commission (act Mar. 7, 1928), 1929.....	4,500.00			4,500.00	4,381.91	66.76	51.33	
Flood control, Mississippi River and tributaries (War Department, act Mar. 7, 1928).....	29,240.00	400.00	342.42	29,982.42	23,965.56	4,057.51	1,959.35	
Helium plants, Bureau of Mines (Commerce Department, act Mar. 7, 1928), 1929.....	2,300.00	266.66		2,566.66	2,470.66	35.56	60.44	
Investigating potash deposits, Bureau of Mines (Commerce Department, act Feb. 15, 1928), 1929.....	10,000.00			10,000.00	9,887.83	110.55	9,998.38	
Maintenance and improvement of existing river and harbor works (War Department, act Mar. 7, 1928).....	57,080.00		38.20	57,118.20	32,964.87	6,868.45	39,833.32	
Salaries and expenses, Forest Service (Agriculture Department, act Mar. 7, 1928), 1929.....	1,121.63			1,121.63	1,121.63		1,121.63	
Southern Appalachian National Park (act May 21, 1920), 1926-27.....	2,000.00			2,000.00	2,000.00		2,000.00	

Supervising mining operations on leased Indian lands (act Mar. 7, 1928), 1929-----	60,000.00	3,114.63	-----	63,114.63	156.94	63,114.63	-----
Supervising mining operations on leased Indian lands (act Mar. 4, 1929), 1929-----	10,000.00	3.00	-----	10,003.00	356.92	10,003.00	-----
Water boundary, United States and Mexico (State Department, act Feb. 15, 1928), 1929-----	18,440.00	36.07	-----	18,476.07	76.46	18,460.99	15.08
Waterways treaty, United States and Great Britain (State Department, act Feb. 15, 1928), 1928-29-----	61,971.11	1,426.91	161.54	63,559.56	62,663.96	63,549.35	10.21
Waterways treaty, United States and Great Britain (State Department, act Mar. 4, 1929), 1929-----	11,800.00	-----	22.89	11,822.89	7,066.68	9,270.92	2,551.97
	2,447,062.12	884,967.17	108,341.74	3,440,371.03	3,278,186.77	3,389,716.41	50,654.62

^a In addition to these appropriations an item of \$120,000 for printing and binding for the Geological Survey was contained in the appropriation act, but the account was not kept in the Geological Survey. There was also an allotment of \$14,765.10 for miscellaneous supplies from the appropriation for contingent expenses of the Interior Department.

^b This subtotal includes \$146,400 supplemental appropriation on account of the act of May 28, 1928, and \$20,000 for standard topographic surveys for expenditure in cooperation with States or municipalities, appropriated in the second deficiency act, fiscal year 1929, approved Mar. 4, 1929.

New topographic surveys of the United States, July 1, 1923, to June 30, 1929, and total area surveyed in each State

State	Publication contour interval (feet)	Mapped in fiscal year (square miles) for publication on scale of 1 to—					Total area mapped in fiscal year (square miles)			Total area mapped to June 30, 1929 (square miles)	Percentage of total area of State mapped to June 30, 1929	River surveys, scale 1 : 20,000 (linear miles)	Spirit levels (miles)	Transit traverse (miles)	Triangulation stations occupied
		12,000	20,000	24,000	31,680	62,500	125,000	Revision	Resurvey						
Alabama.....	20					457	480		206	251	41.3		65	34	
Arizona.....	100								480		51.3		92		
Arkansas.....	10										40.7	16	239		
California.....	5, 20, 25				568			46	816		79.5		963		100
Colorado.....	25, 50	20		294							53.4		3		
Connecticut.....				14		17			34	17	50.0			232	
Delaware.....										4,965	100.0				
District of Columbia.....										2,370	100.0				
Florida.....										70	100.0				
Georgia.....										4,716	8.0				
Idaho.....	2, 100									21,835	41.9				
Illinois.....	5, 10, 20	61			300				61	300	33.7		8		
Indiana.....	5, 20				1,330				143	1,387	55.9	124	548	1,151	
Iowa.....	20				3					3,068	10.1	114	219	170	
Kansas.....					144				144	13,167	23.5				
Kentucky.....	20				2,004				2,004	64,159	78.1	172	790	1,067	
Louisiana.....										25,236	62.2				
Maine.....	20					1,071				8,823	18.2		354	43	36
Maryland.....										14,406	43.6				
Massachusetts.....										12,327	100.0				
Michigan.....	5, 10, 20					546				8,266	23.3		356		
Minnesota.....	2, 5, 10, 20									7,354	8.7				
Mississippi.....	2, 5					104			104	3,985	8.5	196	486	313	
Missouri.....	20				228				228	43,063	62.1		193	280	5
Montana.....	2, 5	57							57	41,891	23.5		88		
Nebraska.....										27,117	35.0				
Nevada.....	2, 5	5		13					18	44,642	40.3		18		4
New Hampshire.....	20					864				8,021	85.9		268	23	2
New Jersey.....										8,224	100.0				
New Mexico.....	20, 25, 50, 100			33			1,318	33	913	405	34.2		387		9
New York.....	20					229			229	49,204	100.0		83		
North Carolina.....	20				79	6			79	19,040	36.3		281	247	15
North Dakota.....	20					887				13,076	18.5		224		
Ohio.....										41,040	100.0				
Oklahoma.....	10, 20					1,073		249		1,048	58.8	12			
Oregon.....	100									41,208	32.8		135		
Pennsylvania.....	20								22	31,762	79.3		259	257	
Rhode Island.....						896				35,763	100.0				
South Carolina.....										1,248	44.3				
										13,737					

South Dakota	20					379				316	153	19,243	24.8		497	349	14
Tennessee	1, 5, 10					737				752	6	23,380	55.6		517	559	
Texas	50					6						87,367	32.9		114		11
Utah	10, 20					128						19,103	22.5		232		
Vermont	20					305						7,495	78.4		745	343	
Virginia	100									504	45	37,749	88.6		61		
Washington												33,374	51.2				
West Virginia												24,170	100.0				
Wisconsin	10, 20					510					510	18,349	32.7		295		
Wyoming												30,374	31.0				
Total continental United States (exclusive of Alaska)												1,320,839	43.6		8,520	5,068	196
Hawaii	10, 50	143	e 266	354	1,724	11,196	3,650	328	4,049	12,690	266	6,295	97.6	838	22		15

a Mapped on scale of 1:4,800.

b 200 miles mapped on scale of 1:24,000; 3 miles on 1:1,200; 1 mile on 1:2,400.

c Advance sheet editions in 10-foot contours; final publication in 50-foot contours and on a scale of 1:62,500.



RECLAMATION

RECLAMATION TABLE 1.—Consolidated financial statement, June 30, 1929

DEBIT SIDE		
Construction account:		
Primary projects—		
Cost of irrigation works—		
Original construction.....	\$174, 162, 413. 56	
Supplemental construction.....	10, 360, 934. 28	
Value of works taken over.....	2, 062, 994. 39	
Total construction cost.....		\$186, 586, 342. 23
Operation and maintenance prior to public notice (net).....	2, 677, 169. 30	
Operation and maintenance deficits and arrearages funded with construction.....	4, 529, 159. 18	
Penalties on water-right charges funded with construction.....	1, 198, 857. 48	
		8, 405, 185. 96
Less—		194, 991, 528. 19
Abandoned works, nonreimbursable cost and charge-offs.....	16, 546, 277. 38	
Construction revenues.....	5, 333, 678. 29	
Contributed funds.....	1, 320, 870. 80	
		23, 200, 826. 47
Balance repayable.....		\$171, 790, 701. 72
Yuma auxiliary project—		
Cost of irrigation works.....		875, 394. 43
Less: Construction revenues.....		296. 87
		875, 097. 56
Secondary projects and general investigations:		
Cost of surveys and investigations.....	2, 891, 028. 04	
Less: Contributed funds.....	546, 737. 93	
		2, 344, 290. 11
Plant and equipment.....		
Materials and supplies.....		856, 482. 32
Accounts receivable:		610, 906. 91
Current accounts due.....	1, 915, 450. 20	
Deferred accounts not due.....	152, 754, 416. 69	
		154, 669, 866. 89
Prepaid civil-service retirement fund.....		2, 340. 33
General office expense undistributed.....		609, 854. 56
Undistributed clearing cost accounts.....		56, 140. 54
Unadjusted debits: Disbursement vouchers in transit.....		7, 466. 65
Cash:		
Balance on hand—		
Reclamation fund.....	7, 887, 967. 27	
Yuma auxiliary fund.....	159, 061. 18	
Special funds.....	123, 160. 30	
		8, 170, 188. 75
Cash in special deposit and in transit.....		47, 222. 83
		8, 217, 411. 58
Total debits.....		340, 040, 559. 17
CREDIT SIDE		
Security for repayment of cost of irrigation works:		
Contracted construction repayments.....	186, 529, 061. 84	
Yuma auxiliary contracted repayments.....	645, 502. 33	
		187, 174, 564. 17
Current accounts payable.....		1, 340, 884. 19
Deferred and contingent obligations.....		555, 366. 49
Reserves and undistributed profits.....		6, 281, 425. 73
Unadjusted credits: Collection vouchers in transit.....		3, 846. 95
Operation and maintenance results, surplus.....		430, 249. 56

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1929—Con.*

Government aid for reclamation of arid lands:		
Reclamation fund.....	\$145,714,305.92	
Special funds—		
Increase of compensation.....	2,797,960.33	
Rio Grande Dam.....	1,000,000.00	
Wind River Indian (Riverton).....	359,176.04	
Judgments, Court of Claims.....	600,008.24	
Drainage and cut-over lands.....	99,815.08	
General investigations, 1923-Dec. 31, 1924.....	266,352.66	
Arid, semiarid, swamp, and cut-over timberlands.....	45,000.00	
Columbia Basin irrigation project.....	25,000.00	
Colorado River levee system.....	200,000.00	
Total.....	151,107,618.27	
Advances to reclamation fund (bond loan).....	\$20,000,000.00	
Less: Amount repaid.....	9,000,000.00	
	11,000,000.00	
	162,107,618.27	
Less: Nonreimbursable appropriation, Rio Grande Dam.....	1,000,000.00	
	161,107,618.27	
Less: Impairment of funds—		
Abandoned works.....	1,358,181.04	
Nonreimbursable cost.....	478,933.72	
Operation and maintenance cost uncollectible.....	453,290.99	
Charge-offs, act of May 25, 1926.....	14,562,990.44	
	16,853,396.19	
	\$144,254,222.08	
Total credits.....	340,040,559.17	

RECLAMATION TABLE 2.—*Available funds, expenditures, and balances, fiscal year 1929*

Items	Funds					
	Reclamation	Yuma auxiliary	General investigations	Arid, semiarid, swamp, and cut-over timber lands	Columbia Basin irrigation project	Colorado River levee system
Balance on hand July 1, 1928.....	\$9,208,247.50	\$128,761.83	\$8,647.34	\$2,876.66	\$14,054.08	\$74,447.46
Receipts:						
Proceeds from sale of public lands.....	647,236.95					
Proceeds from sale of town lots.....	1157.46					
Proceeds from oil leasing act.....	1,852,785.03					
Proceeds from potassium royalties.....	12,517.57					
Proceeds from Federal power licenses.....	17,201.18					
From project collections.....	7,321,855.35	30,299.35				
From general Treasury.....			18,647.34	15,000.00		100,000.00
Total.....	19,059,686.12	159,061.18		17,876.66	14,054.08	174,447.46
Expenditures:						
Repayment bond loan.....	1,000,000.00					
Disbursements.....	10,171,718.85			8,337.29	688.36	74,192.25
Total.....	11,171,718.85			8,337.29	688.36	74,192.25
Balance on hand, June 30, 1929.....	7,887,967.27	159,061.18		9,539.37	13,365.72	100,255.21

¹ Contra.

RECLAMATION TABLE 3.—*Accretions to reclamation fund, by States*

States	Sale of public lands		Proceeds from oil-leasing act		Potassium royalties and rentals ¹	Total to June 30, 1929
	Fiscal year 1929	To June 30, 1929	Fiscal year 1929	To June 30, 1929		
Alabama.....			\$4,409.00	\$52,656.93		\$52,656.93
Arizona.....	\$65,188.10	\$2,392,620.60				2,392,620.60
California.....	85,208.27	7,825,216.32	321,448.97	7,049,173.75	\$52,684.69	14,927,074.76
Colorado.....	58,627.54	10,030,642.24	50,951.66	272,258.41		10,302,900.65
Idaho.....	24,279.01	6,859,974.51	1,497.85	4,546.37		6,864,520.88
Kansas.....		1,032,764.48				1,032,764.48
Louisiana.....			6,059.26	18,167.66		18,167.66
Montana.....	64,936.32	15,041,338.77	56,593.98	855,134.95		15,896,473.72
Nebraska.....	2,515.69	2,092,488.16				2,092,488.16
Nevada.....	13,271.16	979,755.25	365.00	3,053.10		982,808.35
New Mexico.....	90,440.33	6,142,930.36	22,636.61	59,278.49		6,202,208.85
North Dakota.....	942.12	12,207,497.76	15,205.64	54,400.37		12,261,898.13
Oklahoma.....	² 1,297.41	5,924,052.79				5,924,052.79
Oregon.....	40,466.25	11,846,011.59				11,846,011.59
South Dakota.....	4,336.88	7,712,489.41	20.00	335.48		7,712,824.89
Utah.....	83,782.29	4,070,474.11	44,343.30	179,789.56		4,250,263.67
Washington.....	9,422.78	7,354,369.10	225.78	13,741.97		7,368,111.07
Wyoming.....	105,117.62	8,119,348.95	1,329,027.98	27,407,900.57		35,527,249.52
Total.....	647,236.95	109,631,974.40	1,852,785.03	35,970,437.61	52,684.69	145,655,096.70
Proceeds, Federal water-power licenses.....						³ 59,209.22
Grand total.....						145,714,305.92

¹ Proceeds for fiscal year, \$12,517.57.² Contra.³ Proceeds for fiscal year, \$17,201.18.

NOTE.—Sales of reclamation town lots are no longer considered as accretions to the reclamation fund for the reason that Subsec. 1 of section 4 of the act of Dec. 5, 1924 (43 Stat. 701), provides for the crediting of profits from this source to the construction charge of the various projects.

RECLAMATION TABLE 4.—Consolidated statement, by projects, of construction cost of irrigation works, other cost reimbursable with construction, and amounts to be repaid by water users

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance deficits and arrearages and penalties		Construction revenues and contributed funds (contra)		Abandoned works, non-reimbursable cost and authorized charge-offs ¹		Total to be repaid by water users	
	Fiscal year 1923	To June 30, 1929	Fiscal year 1929	To June 30, 1929	Fiscal year 1929	To June 30, 1929	Fiscal year 1929	To June 30, 1929	Fiscal year 1929	To June 30, 1929	Fiscal year 1929	To June 30, 1929
Arizona: Salt River-----		\$12,744,222.50		\$115,993.50		\$2,921.96		\$2,312,096.81		\$352,097.31		\$10,166,021.97
Arizona-California: Yuma-----		9,350,931.53		374,302.27				213,830.22				9,514,325.54
California: Orland-----		2,393,130.94		12,323.99				25,526.16				2,355,280.79
Colorado:-----												
Grand Valley-----		9,964.08		138,621.28				54,718.89		812,374.64		9,964.08
Uncompangre-----		6,438,176.91		299,309.47		\$8,173.50		24,223.72		1,258,322.88		4,039,769.78
Idaho:-----												
American Falls-----		7,635,054.96		9,000.00				19,020.30				7,625,034.66
Boise-----		14,580,884.94		422,283.48		875,739.23		69,974.74				15,726,539.07
King Hill-----		1,905,318.80				110,122.51		28,187.27				1,480,968.94
Minidoka-----		69,495.52		313,431.13		359,612.90		1,803,473.64		2,288.15		5,784,834.73
Minidoka gravity extension-----												
Kansas: Garden City-----		374,541.92		52,868.10				1,000.00				373,541.92
Montana:-----		342,963.68						61,356.82		334,474.96		
Huntley-----		1,562,302.99		164.63		378,925.79		18,386.91		62,049.83		1,859,757.99
Milk River-----		6,768,679.88		1,324.58		88,692.89		83,698.85		1,911,189.00		5,301,603.30
Sun River-----		6,730,296.88		1,312.30		81,126.20		44,429.90		83,319.70		6,811,857.34
Montana-North Dakota:-----												
Lower Yellowstone-----		3,437,695.45		2,298.48		901,207.63		49,353.23		382,254.00		3,904,997.37
Nebraska-Wyoming: North Platte-----		19,163,144.88		703,116.34		1,506,404.54		256,660.01		30,322.30		21,085,683.45
Nevada: Newlands-----		7,956,626.60		2,155.44		20,405.33		52,346.95		4,437,820.00		3,484,709.54
New Mexico:-----												
Carlsbad-----		1,464,522.57		2,176,03.27		1,934.00		26,011.99				
Hondo-----		339,401.68		32,982.01				656.03		371,787.66		1,422,841.31
New Mexico-Texas: Rio Grande-----		14,817,009.01		18,875.50				56,710.50		1,260,675.97		12,971,423.26
North Dakota:-----												
Burdett-Trenton-----		223,423.06		31.75				1,967.62		221,423.09		
Williston-----		517,030.09		165.00				86,970.36		430,494.73		
Oregon:-----												
Baker-----		68,334.33						5,000.00				2,017.13
Umatilla-----		5,176,914.15		2,36,053.71		230,205.34		30,299.55		888,340.82		4,452,425.41
Vale-----		1,305,251.04						5,000.00				1,300,251.04
Oregon-California: Klamath-----		121,447.00		72,943.03		3,712.03		19,600.23		7,499.72		110,249.78
Oregon-Idaho: Owyhee-----		1,609,109.74						320,494.46		695,274.53		1,604,755.13

State	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020
South Dakota: Belle Fourche	231, 137.46	3, 865, 320.21	-----	1, 980.03	163, 606.44	669, 943.43	505.67	17, 071.02	379, 031.58	15, 106.65	4, 127, 172.01		
Utah:													
Salt Lake Basin	724, 565.04	1, 399, 028.95	-----	-----	-----	-----	15, 757.93	34, 327.73	708, 807.11	708, 807.11	1, 364, 701.22		
Strawberry Valley	-----	3, 507, 423.49	-----	-----	-----	-----	21, 870.56	258, 379.12	2, 21, 870.56	2, 21, 870.56	3, 331, 243.04		
Washington:													
Okanogan	4, 159.40	1, 451, 720.31	-----	-----	-----	-----	25, 194.37	630.78	998, 318.06	2, 994, 158.66	424, 198.97		
Yakima	35, 133.98	14, 441, 902.32	-----	-----	-----	-----	8, 338.96	358, 561.04	4, 214.60	26, 795.02	14, 098, 495.53		
Yakima-Kittitas	2, 641, 379.65	4, 907, 003.47	-----	-----	-----	-----	30.00	1, 100.76	2, 541, 349.65	2, 541, 349.65	4, 905, 902.71		
Wyoming:													
Riverton	386, 924.13	3, 354, 981.05	6, 504.85	13, 478.33	-----	-----	19, 697.68	13, 535.56	373, 731.30	373, 731.30	3, 354, 923.82		
Shoshone	85, 289.83	9, 577, 644.36	7, 087.20	28, 061.37	3, 485.07	306, 913.59	2, 81, 445.72	76, 852.07	1, 702, 298.84	177, 307.82	8, 135, 468.41		
Total	7, 898, 304.69	186, 586, 342.23	153, 782.21	2, 677, 169.30	625, 210.28	5, 728, 016.66	2, 317, 567.42	6, 654, 549.09	16, 540, 277.38	5, 683, 982.31	171, 790, 701.72		

Abandoned works: 1

Garden City.....	\$334,474.96
Hondo.....	371,787.66
Buford-Trenton.....	221,423.69
Williston.....	430,494.73

Nonreimbursable cost:

Salt River.....	382,097.31
Rio Grande Dam.....	1,000,000.00
	<hr/>
	1,382,097.31

Authorized charge-offs, act of May 25, 1926:

Grand Valley	812,374.64
Uncompahgre	1,258,322.88
Boise	82,393.84
King Hill	497,285.10
Mindoka	2,288.10
Huntley	62,049.83
Milk River	1,911,189.00
Sun River	89,319.70
Lower Yellowstone	382,254.00
North Platte	30,422.30
Newlands	4,437,820.00
Rio Grande	260,673.97
Umatilla	888,340.82
Klamath	7,499.72
Belle Fourche	379,031.58
Okanogan	998,318.06
Yakima	4,214.60
Shoshone	1,702,298.84

Contra.

RECLAMATION TABLE 6.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns and other credits, and results to December 31, 1928

State and project	Cost	Operation and maintenance returns				Other credits		Results, excess (+) or deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amounts to be repaid with construction	
Arizona: Yuma auxiliary	\$252,676.14	\$299,017.98	\$537.74	\$1,106.79	\$4,305.05			+\$30,077.84
Arizona-California: Yuma	3,746,167.38	3,893,337.96	89,620.98	46,461.52	158,950.59		\$2,921.96	+322,202.59
California: Orland	384,498.95	413,562.92	1,246.30	18,214.95	2,695.19			+14,790.51
Colorado:								
Grand Valley	48,803.00	48,000.00			803.00			
Uncompahgre	810,151.77	809,863.56	14,129.34	11,602.77	16,246.27			+18,484.63
Idaho:								
Boise	2,229,071.99	1,567,533.10	31,157.58	46,526.29	111,044.96		601,024.95	+35,162.31
Boise (drainage)	506,005.16	473,656.38	38,611.62	6,123.43				+139.41
King Hill	156,734.25	60,711.27		1,519.05	342.89		97,199.14	
Minidoka	2,068,281.45	1,638,649.18	29,463.35	22,341.74	99,248.36		268,060.44	+4,798.14
Montana:								
Hundley	1,014,943.79	557,745.45	15,712.18	10,449.84	11,596.01	1 \$81,354.00	358,985.39	
Milk River	150,503.21	177,509.51		1,090.00	3,593.09		88,692.89	+18,202.28
Sun River	279,341.33	157,623.40	6,360.24	3,468.33	16,022.23	1 94,148.00	69,238.48	+602.69
Montana-North Dakota: Lower Yellowstone	1,176,563.43	214,078.55	2,59	4.63	129,831.19		861,460.22	+28,799.49
Nebraska-Wyoming: North Platte	2,700,926.04	1,772,179.23	27,304.03	35,811.80	29,376.14		1,043,732.72	+135,853.68
Nevada: Newlands	1,453,190.54	1,188,795.73	28,660.62	24,970.08	26,012.61	1 211,292.00	15,876.45	-7,523.21
New Mexico: Carlsbad	749,110.33	713,523.15	27,364.31	14,016.86	23,235.60		1,934.00	+2,929.87
New Mexico-Texas: Rio Grande	12,322,567.39	2,245,246.57	7,989.28	4,486.44	49,058.12			-24,759.86
North Dakota:								
Buford-Trenton	74,781.07	2,317.41			10.00	2 72,453.66		
Williston	904,662.04	34,042.75	45.81		489,754.75	2 380,818.73		
Oregon: Umatilla	683,995.37	372,168.49	7,697.84	3,314.38	40,006.32	1 91,083.35	188,526.88	+12,173.13
Oregon-California: Klamath	1,093,615.62	987,682.80	3,544.52	4,942.27	58,767.22		3,712.03	-25,148.78
South Dakota: Belle Fourche	1,378,677.13	752,308.18	29,196.35	9,240.72	21,262.75	1 110,606.00	570,194.90	+104,650.33
Utah: Strawberry Valley	437,856.39	376,886.88	10,196.17	11,858.67	20,400.36		31,447.25	-10,790.46
Washington:								
Okanogan	649,410.01	559,371.28	1,451.15	367.47	70,485.39		25,194.37	+6,694.71
Yakima	3,821,315.85	3,658,358.17	75,029.72	47,492.96	116,663.21		75,047.48	+56,289.77
Wyoming: Shoshone	898,724.67	565,258.71	13,652.88	11,052.86	45,695.17	1 98,036.00	217,330.47	-29,904.30
Total	29,862,579.80	23,409,422.61	458,974.60	336,493.85	1,545,307.01	1,028,791.74	4,520,600.02	+764,022.33

1 Charge-offs under act of May 25, 1926 (44 Stat. 636).

2 Projects abandoned.

RECLAMATION TABLE 15.—Summary of construction results to June 30, 1929

Items	To June 30, 1929		To June 30, 1928		Increase	
Reservoir capacity available (original)-----	Acre-feet 12, 881, 963		Acre-feet 12, 829, 523		Acre-feet 52, 440	
CANALS, DITCHES, AND DRAINS						
Canals over 800 second-feet capacity-----	Miles 564. 8		Miles 546. 5		Miles 18. 3	
Canals 301 to 800 second-feet capacity-----	729. 1		715. 8		13. 3	
Canals 50 to 301 second-feet capacity-----	2, 334. 8		2, 324. 3		10. 5	
Canals less than 50 second-feet capacity----	9, 469. 1		9, 449. 1		20. 0	
Total canals-----	13, 097. 8		13, 035. 7		62. 1	
Waste-water ditches-----	1, 084. 0		1, 061. 2		22. 8	
Drains, open-----	2, 146. 4		2, 042. 4		104. 0	
Drains, closed-----	229. 2		225. 8		3. 4	
Total-----	3, 459. 6		3, 329. 4		130. 2	
Grand total-----	16, 557. 4		16, 365. 1		192. 3	
TUNNELS						
Number-----	122		118		4	
Length (feet)-----	175, 536		164, 083		11, 453	
STORAGE AND DIVERSION DAMS						
Masonry-----	Cubic yards 2, 813, 740		Cubic yards 2, 716, 103		Cubic yards 97, 637	
Earth-----	16, 458, 599		16, 092, 473		366, 126	
Rock-fill and crib-----	2, 120, 236		2, 074, 733		45, 503	
Total-----	21, 392, 575		20, 883, 309		509, 266	
DIKES AND LEVEES						
Length and volume-----	Feet 1, 285, 691	Cubic yards 6, 865, 765	Feet 1, 249, 122	Cubic yards 6, 717, 369	Feet 36, 569	Cubic yards 148, 396
	Concrete	Wood	Concrete	Wood	Concrete	Wood
CANAL STRUCTURES						
Costing over \$2,000-----	Number 1, 553	Number 249	Number 1, 540	Number 242	Number 13	Number 7
Costing \$500 to \$2,000-----	3, 532	1, 068	3, 465	1, 052	67	16
Costing \$100 to \$500-----	18, 837	11, 358	18, 520	11, 182	317	176
Costing less than \$100-----	32, 926	78, 939	32, 353	77, 810	573	1, 129
Total-----	56, 848	91, 614	55, 878	90, 286	970	1, 328
Grand total-----	148, 462		146, 164		2, 298	
	Number	Length	Number	Length	Number	Length
BRIDGES						
Steel-----	112	Feet 9, 124	112	Feet 9, 124	0	Feet 0
Combination-----	441	13, 371	434	13, 020	7	351
Wood-----	10, 669	249, 413	10, 390	242, 091	279	7, 322
Concrete-----	409	5, 541	396	5, 285	13	256
Total-----	11, 631	277, 449	11, 332	269, 520	299	7, 929
CULVERTS						
Concrete-----	3, 864	204, 235	3, 720	194, 078	144	10, 157
Metal-----	3, 550	127, 630	3, 211	114, 289	339	13, 341
Terra cotta-----	2, 129	84, 716	2, 115	84, 048	14	668
Wood-----	4, 500	118, 815	4, 475	117, 364	25	1, 451
Total-----	14, 043	535, 396	13, 521	509, 779	522	25, 617
PIPE						
Concrete-----	Linear feet 1, 110, 236		Linear feet 1, 062, 079		Linear feet 48, 157	
Metal-----	448, 315		401, 601		46, 714	
Terra cotta (tile)-----	1, 822, 703		1, 757, 788		64, 915	
Wood-----	709, 842		709, 842		0	
Total-----	4, 091, 096		3, 931, 310		159, 786	

RECLAMATION TABLE 15.—*Summary of construction results to June 30, 1929—*
Continued

Items	To June 30, 1929		To June 30, 1928		Increase	
	Number	Length	Number	Length	Number	Length
FLUMES						
Concrete.....	126	<i>Feet</i> 78,696	104	<i>Feet</i> 73,448	22	<i>Feet</i> 5,248
Metal.....	1,974	238,400	1,897	234,643	77	3,757
Wood.....	2,711	535,926	2,692	534,838	19	1,088
Total.....	4,811	853,022	4,693	842,929	118	10,093
CANALS LINED						
Length (miles).....	485.4	4.1	470.8	4.1	14.6	0.0
Total.....	489.5		474.9		14.6	
BUILDINGS						
Offices.....	<i>Number</i> 101		<i>Number</i> 101		<i>Number</i> 0	
Residences.....	731		731		0	
Power plants.....	35		35		0	
Pumping stations.....	238		236		2	
Barns, storehouses, etc.....	575		575		0	
Total.....	1,680		1,678		2	
WELLS						
Number and depth.....	692	<i>Feet</i> 73,415	688	<i>Feet</i> 72,853	4	<i>Feet</i> 562
COMMUNICATIONS						
Roads.....	<i>Miles</i> 1,203.4		<i>Miles</i> 1,089.5		<i>Miles</i> 113.9	
Railroads.....	110.3		87.9		22.4	
Telephone lines.....	3,350.3		3,350.3		0	
Transmission lines.....	2,056.0		1,914.9		141.1	
Total.....	6,720.0		6,442.6		277.4	
POWER DEVELOPED						
Water and steam.....	<i>Horsepower</i> 166,128		<i>Horsepower</i> 166,103		<i>Horsepower</i> 25	
EXCAVATION						
Class 1, earth.....	<i>Cubic yards</i> 248,365,612		<i>Cubic yards</i> 240,665,663		<i>Cubic yards</i> 7,699,949	
Class 2, indurated material.....	15,961,312		14,482,633		1,478,679	
Class 3, rock.....	12,495,576		11,677,836		817,740	
Total.....	276,822,500		266,826,132		9,996,368	
Riprap (cubic yards).....	2,522,787		2,515,400		7,387	
Paving (square yards).....	1,080,328		1,068,994		11,334	
Concrete (cubic yards).....	4,191,553		4,011,800		179,753	
Cement (barrels).....	4,664,450		4,429,427		235,023	
Gunite (square yards).....	898,096		754,868		143,228	

RECLAMATION TABLE 19.—*Settlement and economic data, 1928*

	Irrigated farms		Towns		Number of schools	Number of churches	Banks			
	Number	Population	Number	Population			Number	Capital stock	Deposits	Number of depositors
Arizona: Salt River.....	8,300	50,000	12	80,000	70	68	15	\$1,600,000	\$35,000,000	50,700
Arizona-California: Yuma.....	1,731	3,637	5	10,100	14	25	3	215,000	2,725,700	7,635
California: Orland.....	695	1,812	1	1,700	10	8	2	185,000	1,295,400	3,450
Colorado:										
Grand Valley.....	416	1,230	6	15,040	24	32	4	365,000	4,000,000	9,000
Uncompahgre.....	1,770	5,741	3	7,400	27	27	6	514,300	3,872,700	11,250
Idaho:										
Boise.....	3,797	10,170	16	47,670	55	79	15	2,195,000	28,750,000	35,000
King Hill.....	185	546	3	1,285	5	5	1	20,000	300,000	900
Mindoka.....	2,287	8,420	6	8,595	23	40	5	200,000	2,368,500	5,050
Montana:										
Huntley.....	586	1,765	5	682	8	8	1	25,000	200,000	500
Milk River.....	382	1,346	17	8,595	32	35	11	435,000	6,083,600	10,205
Sun River.....	368	891	4	416	10	10	2	51,000	174,000	615
Montana-North Dakota: Lower Yellowstone.....	420	856	8	3,035	17	19	5	149,000	1,032,000	2,775
Nebraska-Wyoming: North Platte.....	2,851	9,002	18	26,050	102	61	16	500,000	6,265,900	19,400
Nevada: Newlands.....	2,681	2,500	5	2,700	13	9	1	75,000	1,230,400	1,800
New Mexico: Carlsbad.....	425	2,307	4	5,000	8	11	1	80,000	1,000,000	1,800
New Mexico-Texas: Rio Grande.....	4,728	22,539	37	144,076	82	122	10	2,300,000	33,628,600	37,160
Oregon: Umatilla.....	288	805	2	1,055	4	4	1	25,000	265,000	1,200
Eastern division.....	168	500	3	600	3					
Western division.....	120	305	3	455	1					
Oregon-California: Klamath.....	624	2,351	5	15,025	34	15	6	637,000	6,687,000	14,000
South Dakota: Belle Fourche.....	876	2,165	4	2,785	23	9	4	160,000	3,061,000	3,000
Utah: Strawberry Valley.....	2,751	6,950	12	18,900	27	26	5	235,000	1,750,000	8,350
Washington:										
Okanogan.....	383	991	3	3,500	6	8	3	125,000	1,429,000	2,500
Yakima.....										
Sunnyside.....	3,467	10,142	11	8,475	42	31	9	260,000	2,399,000	7,423
Tieton.....	1,380	3,907	8	27,825	11	4				
Kittitas.....	1,355	1,065	5	9,500	24	16	6	375,000	5,195,100	9,400
Wyoming:										
Riverton.....	14	36	4	2,220	3	8	1	50,000	485,000	1,000
Shoshone.....	860	1,989	5	1,572	5	9	3	70,000	535,000	2,260
Total.....	40,788	153,663	212	451,811	687	689	136	8,846,300	147,732,900	248,373

RECLAMATION TABLE 20.—*Irrigation and crop results, Government reclamation projects, 1928*¹

State and project	Lands in projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water service contracts				
	Irrigable acreage ²	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Arizona: Salt River	245, 940	245, 940	219, 970	\$26, 082, 055	\$118. 57	68, 170	61, 000	61, 000	\$6, 547, 130	\$107. 33
Arizona-California:										
Yuma	63, 700	53, 700	53, 100	4, 831, 705	90. 98					
Yuma Auxiliary (Mesa)	2, 445	1, 040	480	75, 330	157. 23					
California: Orland	20, 730	14, 465	13, 310	759, 380	57. 07	230	220	140	32, 840	232. 88
Colorado:										
Grand Valley	30, 400	14, 960	13, 340	552, 715	38. 47	18, 400	13, 400	13, 000	1, 802, 000	138. 60
Uncompahgre	75, 650	60, 820	60, 750	2, 265, 100	37. 29	1, 650	1, 550	1, 545	38, 070	24. 64
Idaho:										
Boise	171, 450	160, 975	149, 260	4, 938, 040	33. 08	145, 200	130, 200	125, 700	4, 485, 000	35. 68
King Hill	8, 000	6, 525	6, 230	176, 620	28. 33					
Mindoka	120, 905	104, 580	98, 495	3, 321, 720	33. 72	798, 290	683, 310	649, 090	28, 377, 840	43. 70
Gravity division	71, 975	59, 500	55, 730	1, 842, 630	33. 07					
Pumping division	48, 930	45, 080	42, 765	1, 479, 090	34. 59					
Montana:										
Huntley	32, 500	20, 800	21, 800	698, 430	32. 04					
Milk River	72, 435	13, 830	13, 820	211, 195	13. 35	43, 950	22, 300	22, 300	473, 190	21. 16
Sun River	55, 875	14, 080	24, 800	388, 210	16. 00					
Fort Shaw division	13, 900	6, 220	4, 630	111, 920	16. 15					
Greenfields and Big Coulee division	41, 975	7, 860	17, 570	276, 290	15. 46					
Montana-North Dakota: Lower Yellowstone	38, 250	19, 770	19, 770	499, 450	25. 27					
Nebraska-Wyoming: North Platte	236, 410	192, 290	185, 650	5, 455, 210	29. 38	127, 635	106, 635	103, 085	4, 205, 375	40. 79
Pathfinder irrigation district	113, 670	89, 890	89, 890	2, 459, 790	27. 26					
Gering and Fort Laramie irrigation district	55, 075	54, 360	48, 260	1, 653, 380	33. 84					
Goshute irrigation district	51, 490	36, 260	36, 260	1, 115, 080	30. 75					
Northport irrigation district	16, 175	11, 780	11, 240	235, 960	20. 99					
Nevada: Newlands	87, 500	49, 970	46, 085	1, 773, 200	38. 50					
New Mexico: Carlsbad	25, 280	23, 280	23, 280	1, 291, 160	54. 21					
New Mexico-Texas: Rio Grande	132, 420	143, 320	139, 600	12, 733, 680	91. 22	48, 970	48, 970	48, 970	2, 431, 620	48. 02
Oregon: Umatilla	18, 730	11, 395	11, 040	242, 740	21. 98					
Oregon-California: Klamath	53, 560	46, 530	45, 450	1, 240, 300	28. 00	63, 630	35, 705	35, 515	557, 730	15. 70
Main division	41, 550	36, 730	36, 610	1, 041, 590	28. 45					
Tule Lake division	12, 010	9, 800	8, 840	228, 710	25. 85					
South Dakota: Belle Fourche	74, 500	35, 910	46, 700	1, 173, 370	25. 13					
Utah: Strawberry Valley	41, 805	39, 395	38, 850	1, 202, 115	30. 94	7, 400	7, 010	6, 990	184, 000	26. 32

Washington:	7, 150	4, 150	3, 000	1, 092, 725	303. 73	166, 720	124, 140	124, 140	13, 342, 200	107. 00
Okanogan.....	133, 635	115, 635	103, 140	8, 242, 930	79. 92					
Yakima.....	102, 520	88, 835	80, 890	5, 467, 160	67. 58					
Sunnyside division.....	31, 115	27, 100	22, 250	2, 775, 770	124. 75					
Tieton division.....										
Wyoming:										
Shoshone.....	73, 640	43, 830	42, 980	954, 760	22. 21					
Garland division.....	41, 650	35, 030	34, 300	792, 090	23. 10					
Frankie division.....	20, 060	7, 640	7, 580	151, 710	20. 00					
Willwood division.....	11, 930	1, 160	1, 100	10, 960	9. 93					
Riverton.....	20, 000	1, 580	520	6, 670	12. 95					
Total with irrigation.....	1, 882, 930	1, 442, 080	1, 385, 560	80, 238, 800	57. 91	1, 490, 735	1, 235, 020	1, 192, 030	62, 495, 320	52. 43
Cropped without irrigation:										
Milk River.....			19, 100	191, 380	10. 02					
Sun River.....			12, 970	193, 140	10. 50					
Lower Yellowstone.....			16, 880	208, 800	12. 37					
Klamath.....			54, 730	245, 620	4. 45					
Total cropped without irrigation.....			103, 080	838, 950	8. 09					
Grand total.....	1, 882, 930	1, 442, 080	1, 489, 240	81, 077, 750	54. 44	1, 490, 735	1, 235, 020	1, 192, 030	62, 495, 320	52. 43

¹ Data are for calendar year (irrigation season) except in Salt River project where data are for corresponding "agricultural year," October, 1927, to September, 1928.

² Area for which bureau was prepared to supply water.

³ Includes 20,000 acres reported as vacant, 2,414 acres of "home tracts," and 3,548 acres on which no crops were reported

⁴ Includes dry farm tracts irrespective of the figures given below under "cropped without irrigation."

RECLAMATION TABLE 21.—*Summary of crop results on reclamation projects in 1928*¹

NOTE.—These figures are limited to crops covered by census on Government projects proper, excluding all crops in areas served with water under the Warren Act, but including nonirrigated crops grown on the projects.

Crop	Acreage cropped		Yields		Crop value		
	Total	Per cent of cropped	Total	Average per acre	Average per acre	Total	Per cent of total value of all crops
Cereals:			<i>Bushels</i>				
Barley.....	70, 149	4. 7	2, 330, 980	33. 2	\$19. 61	\$1, 375, 817	1. 7
Corn.....	47, 940	3. 2	1, 283, 050	26. 7	20. 70	991, 926	1. 2
Oats.....	39, 546	2. 6	1, 413, 229	35. 7	14. 61	577, 981	. 7
Rye.....	3, 701	. 3	67, 703	18. 2	16. 00	59, 086	-----
Wheat.....	178, 470	12. 0	4, 762, 711	26. 7	25. 61	4, 571, 620	5. 6
Total.....	339, 806	22. 8	9, 857, 673	29. 0	22. 30	7, 576, 430	9. 3
Other grain and seed:							
Alfalfa seed.....	20, 348	1. 3	87, 312	4. 2	37. 10	755, 911	. 9
Clover seed.....	23, 825	1. 6	82, 285	3. 4	42. 51	1, 012, 903	1. 2
Flax seed.....	1, 112	. 1	9, 338	8. 4	15. 61	17, 365	-----
Total.....	45, 285	3. 0	178, 935	3. 9	39. 44	1, 786, 179	2. 2
Hay and forage:			<i>Tons</i>				
Alfalfa hay.....	436, 488	29. 3	1, 274, 087	2. 9	36. 46	15, 915, 058	19. 6
Clover hay.....	18, 667	1. 2	24, 567	1. 3	11. 91	222, 470	. 3
Other hay.....	27, 799	1. 9	28, 736	1. 0	8. 90	247, 468	. 3
Corn fodder.....	5, 120	. 4	10, 546	2. 0	15. 85	81, 188	. 1
Other forage.....	29, 986	2. 0	237, 450	7. 9	27. 00	809, 194	. 9
Pasture.....	292, 046	19. 6	-----	-----	11. 88	3, 469, 810	4. 3
Total.....	810, 106	54. 4	1, 575, 386	1. 9	25. 60	20, 745, 188	25. 6
Vegetables and truck:			<i>Bushels</i>				
Beans.....	17, 977	1. 2	286, 427	15. 9	50. 67	911, 035	1. 1
Onions.....	2, 759	. 2	912, 695	330. 8	315. 76	871, 200	1. 1
Potatoes, white.....	63, 504	4. 2	10, 531, 091	165. 8	39. 68	2, 519, 924	3. 1
Potatoes, sweet.....	693	-----	85, 841	123. 9	154. 00	106, 718	. 1
Truck.....	46, 521	3. 1	-----	-----	190. 99	8, 885, 234	10. 9
Total.....	131, 454	8. 8	11, 816, 054	89. 9	101. 13	13, 294, 111	16. 4
Fruits and nuts:			<i>Pounds</i>				
Apples.....	23, 811	1. 6	328, 615, 608	13, 801	200. 91	4, 783, 873	5. 9
Peaches.....	3, 118	. 2	21, 004, 822	6, 736	129. 95	405, 191	. 5
Pears.....	5, 431	. 4	44, 477, 084	8, 189	147. 19	799, 386	. 9
Prunes.....	2, 572	. 2	17, 295, 664	6, 724	92. 44	237, 746	. 3
Citrus fruit.....	6, 231	. 4	46, 825, 676	7, 515	191. 93	1, 195, 898	1. 5
Small fruit.....	3, 162	. 2	23, 879, 909	7, 552	240. 43	760, 236	. 9
Miscellaneous.....	5, 718	. 4	17, 374, 706	3, 038	155. 91	891, 501	1. 1
Total.....	50, 043	3. 4	499, 473, 469	9, 988	181. 32	9, 073, 831	11. 2
Miscellaneous:			<i>Tons</i>				
Sugar beets.....	71, 250	4. 8	778, 365	10. 9	78. 50	5, 592, 982	6. 9
Cotton.....	229, 560	15. 4	{ ² 96, 740, 000	421. 4	97. 80	22, 450, 340	27. 7
Cottonseed.....			{ ² 179, 673, 260	782. 7			
Cane.....	931	-----	2, 659	2. 8	31. 14	28, 990	-----
Other crops.....	98, 436	6. 6	-----	-----	5. 38	529, 609	. 6
Total.....	400, 177	26. 9	-----	-----	71. 47	28, 602, 011	35. 3
Duplication.....	287, 631	19. 3	-----	-----	-----	-----	-----
All crops.....	¹ 1, 489, 240	100. 0	-----	-----	54. 44	81, 077, 750	100. 0

¹ Data are for calendar year (irrigation season) except on Salt River project, where the data are for corresponding "agricultural year," October, 1927, to September, 1928.

² Pounds.

³ The dry-farmed area of this total amounted to 103,680 acres, with a total value of \$838,950.

RECLAMATION TABLE 22.—*Irrigated and cropped acreage and crop values by years*

	Federal irrigation projects				Warren Act land			Entire area		
	Irrigated acreage	Cropped acreage	Crop value		Irrigated acreage	Cropped acreage	Crop value		Cropped acreage	For year
			For year	Cumulative total			For year	Cumulative total		Cumulative total
1906	22,300	120,100	\$244,900	\$5,005,300					120,100	\$244,900
1907	187,600	1,169,000	4,760,400	12,581,100					1,169,000	4,760,400
1908	289,500	1,280,500	7,575,800	24,501,800					1,280,500	7,575,800
1909	410,600	1,369,500	11,920,700	37,476,400					1,369,500	11,920,700
1910	465,100	413,000	12,974,600	50,185,000					413,000	12,974,600
1911	541,400	470,100	12,708,600	64,010,400					470,100	12,708,600
1912	588,400	540,000	13,825,400	79,742,600					540,000	13,825,400
1913	699,200	642,200	16,475,500	96,218,100					642,200	16,475,500
1914	761,300	703,400	18,200,000	114,418,100					703,400	18,200,000
1915	814,800	760,000	32,816,000	147,234,100					760,000	32,816,000
1916	923,000	838,300	56,462,300	203,696,400					838,300	56,462,300
1917	1,057,500	966,800	66,821,400	270,517,800					966,800	66,821,400
1918	1,141,500	1,031,200	68,974,100	339,491,900					1,031,200	68,974,100
1919	1,187,300	1,113,500	88,974,100	428,466,000					1,113,500	88,974,100
1920	1,223,500	1,153,800	66,171,700	494,637,700					1,153,800	66,171,700
1921	1,227,500	1,157,900	49,620,300	544,258,000					1,157,900	49,620,300
1922	1,202,130	1,169,100	50,360,900	594,618,900					1,169,100	50,360,900
1923	1,213,700	1,179,870	65,046,300	659,665,200					1,179,870	65,046,300
1924	1,240,900	1,216,600	66,488,600	726,153,800					1,216,600	66,488,600
1925	1,320,300	1,242,800	77,608,900	803,762,700					1,242,800	77,608,900
1926	1,411,000	1,361,500	60,664,900	864,427,600					1,361,500	60,664,900
1927	1,379,000	1,431,600	72,047,200	936,474,800					1,431,600	72,047,200
1928	1,442,100	1,489,200	81,077,800	1,017,552,600					1,489,200	81,077,800

† Estimated.

California.....	4,390	4,248	124	4,372	3,712	660	727	361	169	1,257	50	2,405	465	247	712
Bishop Subagency (under Walker River, Nev.).....	366	355		355	348	7	66			66		282			
Fort Bidwell.....	167	149	5	154	140	14	14	62		76		64	100		100
Fort Yuma.....	182	160	16	176	160	16	28	110		138	1	21	200		200
Hoopla Valley.....	959	942	4	946	697	249	96	189		285		412	165		165
Mission Agency.....	611	605	17	622	522	100	109		92	201	36	285	140		140
Sacramento.....	2,105	2,037	82	2,119	1,845	274	414		77	491	13	1,341	107		107
Colorado: Consolidated Ute.....	214	207	7	214	168	46	14	104		118	2	48	250		250
Idaho.....	972	871	22	893	833	60	73	205	4	299	116	418	200	30	230
Coeur d'Alene.....	165	150	1	154	143	11				25	50	68		30	30
Fort Hall.....	487	412	2	414	369	45	31	162	4	193	32	144	200		200
Fort Lapwai Sanatorium.....	320	309	16	325	321	4	38	43		81	34	206			
Iowa: Sac and Fox.....	111	104	1	105	101	4	41			92		9		70	70
Kansas: Potawatomi.....	248	248		248	248		145			170		78		30	30
Michigan: Mackinac Subagency (under Lac du Flambeau).....	320	320		320	275	45	55			55	120	100			
Minnesota.....	5,139	4,955	15	4,970	4,726	244	596	214	52	1,039	290	3,337	230	170	400
Consolidated Chippewa.....	4,470	4,335		4,335	4,225	110	544		52	773	231	3,221		170	170
Pipestone.....	131	128		128	114	14	9			9		105			
Red Lake.....	538	492	15	507	387	120	43	214		257	59	71	230		230
Mississippi: Choctaw.....	168	162	4	166	150	16				150				200	200
Montana.....	4,141	3,815	50	3,865	3,630	235	323	492	116	1,117	469	2,044	456	214	670
Blackfeet.....	1,095	1,034	8	1,042	957	85	77	150	30	282	94	581	144	30	174
Crow.....	546	514	11	525	494	31	50			50	82	362			
Flathead.....	851	760	24	784	755	29	108			108	192	455			
Fort Belknap.....	375	360	4	364	323	41	75	115		209	37	77	112	30	142
Fort Peck.....	738	662		662	657	5		138	65	203		454	120		120
Rocky Boy.....	129	120	0	120	108	12	8		20	65		15		67	67
Tongue River.....	407	365	3	368	336	32	5	89	1	172	64	100	80	87	167
Nebraska.....	1,273	1,258	56	1,314	844	470	376			376	146	322			
Santee (under Yankton, S. Dak.).....	341	340	2	342	149	193	77			77	38	34			
Ponca (under Yankton, S. Dak.).....	132	131	4	135	69	66	35			35		34			
Winnebago.....	362	355	28	383	320	63	122			122	87	111			
Omaha Subagency.....	438	432	22	454	306	148	142			142	21	143			

It is reasonable to believe that there is a considerable number of the balance indicated out of school who are actually in public school but are not so reported.

Based on 1923 figures.

Day.

Indian school population, number eligible for school attendance, number in schools, etc., and capacity of Government schools provided for Indian children during fiscal year ended June 30, 1929—Continued

States and jurisdictions	Number school children 6 to 18 years, inclusive	Number eligibles 6 to 18 years	Number under 6 or over 18 years in school	Total eligibles (total columns 2 and 3)	Total number in school	Eligibles not in school	Indian children enrolled in schools						Capacity of Government schools		
							Government schools			Mission and private		Public	Reservation		Total capacity
							Non-reservation, boarding	Reservation, boarding	In other reservation, boarding	Day	Total, Government	Boarding	Day	Boarding	
Nevada.....	1, 101	1, 002	25	1, 027	805	222	309	5	10	295	619	23	-----	380	380
Carson Agency.....	221	221	8	229	207	22	85	5	1	86	177	23	-----	175	175
Moapa River Subagency (under Paiute, Utah).....	42	38	3	41	34	7	13	-----	9	-----	22	-----	-----	-----	-----
Walker River.....	312	280	-----	280	193	87	79	-----	-----	61	140	-----	-----	-----	-----
Fallon Subagency.....	94	84	-----	84	52	32	16	-----	-----	29	45	-----	-----	-----	-----
Walker River.....	121	111	-----	111	84	27	33	-----	-----	32	65	-----	40	60	60
Smith and Mason Valley.....	97	85	-----	85	57	28	30	-----	-----	30	30	-----	19	-----	-----
Western Shoshone Agency.....	214	183	14	197	178	19	53	-----	-----	87	140	-----	105	105	105
New Mexico.....	6, 906	6, 000	171	6, 171	4, 931	1, 240	1, 269	1, 373	178	1, 265	4, 085	750	-----	1, 060	2, 548
Eastern Navajo.....	826	826	40	866	866	-----	245	379	64	19	707	159	-----	350	380
Itcarilla.....	167	142	2	144	140	4	6	85	-----	-----	91	49	-----	-----	-----
Mescalero.....	188	179	17	196	164	32	47	109	2	-----	158	4	-----	110	110
Northern Navajo.....	2, 564	2, 064	9	2, 073	1, 073	1, 000	204	720	109	13	1, 046	5	-----	600	630
Northern Pueblos.....	899	889	13	902	827	75	254	-----	-----	467	1, 721	104	-----	30	592
Southern Pueblos.....	1, 474	1, 428	62	1, 490	1, 373	117	401	-----	-----	648	1, 049	256	-----	696	696
Zuni.....	488	472	28	500	488	12	112	80	3	118	313	173	-----	140	140
North Carolina: Cherokee.....	1, 088	1, 083	31	1, 114	579	535	31	418	-----	96	545	-----	-----	400	480
North Dakota.....	3, 435	3, 237	110	3, 347	2, 263	1, 084	619	343	17	90	1, 069	182	-----	452	574
Fort Berthold.....	400	370	36	406	369	37	167	-----	10	44	221	101	-----	52	52
Fort Totten.....	260	202	4	206	164	42	6	105	-----	-----	111	-----	-----	250	250
Standing Rock.....	937	867	39	906	765	141	108	238	7	16	369	21	-----	40	242
Turtle Mountain.....	1, 838	1, 798	31	1, 829	965	864	338	-----	-----	30	388	60	-----	30	30

Oklahoma.	31, 180	30, 849	177	31, 026	24, 456	6, 570	1, 206	2, 377	349	3, 932	1, 524	19, 000	2, 233	2, 233
Chesapeake and Arapaho Agency.	744	716	21	737	634	102	26	228	5	259	15	360	350	2, 233
Kiowa.	1, 649	1, 505	58	1, 563	1, 507	56	76	471	4	551	13	943	445	350
Ossage.	1, 107	1, 044	62	1, 106	886	210	8	6			288	608		445
Pawnee—														
Kaw.	146	146	—	146	137	9	8	6		14	4	119		
Pawnee.	262	258	—	258	242	16	32	99		131	1	110	160	
Otoe.	231	218	2	220	206	14	35	67		102		104		
Ponca Subagency.	242	235	—	235	219	16	45	18		163		156		
Tonkawa.	27	27	—	27	23	4	7			7		16		
Quapaw.	688	689	4	683	508	185	13	304		319		189	200	200
Shawnee.	822	759	30	789	532	237	80		46	126	10	296		
Five Civilized Tribes, total.	25, 252	25, 252	—	25, 252	9, 999	882	400	321	204	2, 300	1, 193	415, 999	1, 018	1, 018
Cherokee Nation.	13, 172	13, 172	—	13, 172	9, 090	4, 082	1, 384	184	207	300	200	7, 962	300	300
Chickasaw Nation.	2, 614	2, 614	—	2, 614	2, 193	421	58	150	4	212	208	1, 773	136	136
Choctaw Nation.	4, 241	4, 241	—	4, 241	4, 241	—	211	296	24	531	583	3, 127	230	230
Creek Nation.	4, 743	4, 743	—	4, 743	4, 743	—	172	278	39	489	157	2, 905	252	252
Seminole Nation.	4, 482	4, 482	—	4, 482	3, 571	5	41	139	20	200	45	232	100	100
Oregon.	1, 050	979	34	1, 013	887	126	164	140	7	50	361	423	120	145
Klamath.	324	299	24	323	316	7	84	18		102	39	175		
Salem Subagency.	280	217	—	217	160	57	39			39		121		
Umatilla.	263	243	1	244	212	32	20	24	7	27	64	121		
Warm Springs.	233	220	9	229	199	30	21	122		50	183	6	120	145
South Dakota.	6, 644	6, 228	204	6, 432	5, 726	706	1, 029	868	478	687	3, 062	1, 934	780	1, 660
Cheyenne River.	847	812	20	832	804	28	138	216	13	55	422	298	180	264
Crow Creek.	206	186	12	198	175	23	41			41	50	84		
Lower Brule Subagency.	214	190	4	194	177	17	38		26	64	41	72		
Flandreau.	90	86	6	92	85	7	43			43	3	39		
Pine Ridge.	2, 050	1, 935	97	2, 032	1, 948	84	195	385	7	444	419	498	350	963
Rosebud.	1, 773	1, 668	33	1, 701	1, 542	159	145	267		188	18	497	250	433
Sisseton.	804	698	15	713	606	107	279		5	284	34	288		
Yankton.	660	653	17	670	389	281	150			150	81	158		
Utah.	334	311	24	335	269	66	52	96	14	43	205	64	83	153
Uintah and Ouray.	296	274	24	298	240	58	5	96	9	27	184	56	83	101
Scattered bands under Palute.	38	37	—	37	29	8			5	16	21	8		52
Washington.	3, 130	2, 877	97	2, 974	2, 744	230	195	181	96	87	559	2, 032	180	289
Colville Agency.	806	728	5	733	565	168	44			22	66	414		25
Spokane Subagency.	215	205	8	203	183	10	5		3		8	176		
Neah Bay.	115	113	2	115	111	4	22			49	71	39		60
Taholah.	267	238	3	241	205	36	14	20			34	157		
Tulalip.	993	911	32	943	943	25	25	161	40	16	242	682	180	204
Yakima.	735	692	47	739	727	12	85		53		138	564		

* Based on 1928 figures.

* It is understood that many additional children, estimated at 3,000, are attending public schools in incorporated towns but the exact number is not known.

Indian school population, number eligible for school attendance, number in schools, etc., and capacity of Government schools provided for Indian children during fiscal year ended June 30, 1929—Continued

States and jurisdictions	Indian children enrolled in schools										Capacity of Government schools						
	Number school children 6 to 18 years, inclusive	Number eligibles 6 to 18 years in school	Number under 6 or over 18 years in school	Total eligibles (total columns 2 and 3)	Total number in school	Eligibles not in school	Government schools				Mission and private	Public	Reservation		Total capacity		
							Non-reservation, boarding	Reservation, boarding	In other reservation, boarding	Day			Total, Government	Boarding		Day	
Wisconsin	1,759	1,796	49	1,845	1,549	296	125	336	2	25	488	678	67	316	440	40	480
Grand Rapids Subagency (under Tomah)	364	353	1	354	349	5	2	90			92	214		43			
Hayward	247	242	19	261	222	39	8	41			49	71		102	170		170
Keshena Agency (Menominee)	598	571	19	590	559	31	36	125		25	186	269	67	37	140	40	180
Lac du Flambeau Agency:																	
Lac du Flambeau	209	186	10	196	134	62	29	71			100			34	130		130
Laona Subagency	130	110		110	74	36	30	8	2		40	1		33			
LaPointe (Bad River and Red Cliff)	211	334		334	211	123	20	1			21	123		67			
Wyoming: Shoshone	516	497	9	506	503	3	23	107			130	242		131	135		135
Florida: Seminole	164	156	8	164	14	150				14	14				15		15
Capacity of nonreservation schools																	10,400
Capacity of sanatorium boarding schools																	538

RECAPITULATION

Indian children of school age	86,275
Indian children eligible for school attendance, 6-18	81,536
Children under 6 or over 18 in school	1,726
Nonreservation boarding	9,639
Reservation boarding	11,994
Day	4,478
Total	26,111
Mission, private, and State schools:	
Boarding	7,121
Day	67
Public schools	7,188
Total	94,288
Total children in school, all classes	41,476
Number of eligible children not in school	67,587
	15,675

PENSIONS

PENSIONS TABLE 1.—*Claims received and disposed of in fiscal year 1929 and number in files June 30, 1929, awaiting responses to calls for information*

Classes	Active June 30, 1928	Received during year	Disposed of during year	Active June 30, 1929
Civil War:				
Soldiers.....	398	10,945	8,853	2,490
Widows, etc.....	2,746	19,154	16,151	2,749
Total.....	3,144	27,099	25,004	5,239
War with Spain:				
Soldiers.....	23,238	71,703	74,494	20,447
Widows, etc.....	3,115	5,388	4,552	3,951
Total.....	26,353	77,091	79,046	24,398
Regular Establishment:				
Soldiers.....	5,281	8,924	9,109	5,096
Widows, etc.....	607	1,244	1,188	663
Total.....	5,888	10,168	10,297	5,759
Indian wars:				
Soldiers.....	998	2,508	3,186	320
Widows, etc.....	676	907	1,125	458
Total.....	1,674	3,415	4,311	778
Old wars.....		7	7	
Navy service.....	8	118	117	9
Special acts.....	1,016	4,829	5,836	9
Total.....	1,024	4,954	5,960	18
Total, all classes.....	38,083	122,727	124,618	36,192
Accrued.....	3,152	8,558	7,920	3,790
Reimbursement.....	1,046	4,001	4,050	997
Half pension.....	308	422	427	303
Grand total.....	42,589	135,708	137,015	41,282

PENSIONS TABLE 2.—*Statement showing loss to roll by death, from July 1, 1928, to June 30, 1929, inclusive*

Month	Soldiers		Widows, etc.		Total
	Civil War	Other classes	Civil War	Other classes	
1928					
July.....	1, 100	333	1, 507	54	2, 994
August.....	938	141	1, 453	13	2, 545
September.....	931	595	1, 395	164	3, 085
October.....	1, 111	348	1, 426	65	2, 950
November.....	1, 085	402	1, 651	82	3, 220
December.....	1, 015	254	1, 611	58	2, 938
1929					
January.....	1, 960	581	2, 856	130	5, 527
February.....	1, 880	531	2, 856	144	5, 411
March.....	1, 568	448	2, 521	118	4, 655
April.....	1, 370	488	1, 880	104	3, 842
May.....	1, 048	419	1, 665	77	3, 209
June.....	1, 083	440	1, 608	87	3, 218
Total.....	15, 089	4, 980	22, 429	1, 096	43, 594

PENSIONS TABLE 3.—*Appropriations for pensions, and disbursements therefrom for the fiscal year ended June 30, 1929, and unexpended balances at close of year*

	Army	Navy	Total
Appropriations:			
Act Mar. 7, 1928.....	\$200,750,000.00	\$9,250,000.00	\$210,000,000.00
Act Mar. 4, 1929.....	17,365,000.00	1,635,000.00	19,000,000.00
Advanced from 1930 appropriation.....	530,000.00	120,000.00	650,000.00
Repayments to appropriations.....	268,879.46	17,930.72	286,810.18
Total to be accounted for.....	218,913,879.46	11,022,930.72	229,936,810.18
Disbursements:			
By disbursing clerk, Bureau of Pensions.....	218,888,502.98	11,001,483.50	229,889,986.48
By Treasury settlements.....	202.00		202.00
Total disbursements.....	218,888,704.98	11,001,483.50	229,890,188.48
Balance June 30, 1929:			
1929 appropriation.....	1.31	4.57	5.88
1930 appropriation.....	25,173.17	21,442.65	46,615.82

PENSIONS TABLE 4.—*Amount paid to pensioners, 1790 to end of fiscal year 1929*

War of the Revolution.....	\$70,000,000.00	Regular Establishment.....	\$86,979,962.39
War of 1812.....	46,188,626.06	World War.....	252,312.75
Indian Wars.....	39,922,373.14	Unclassified.....	16,513,425.54
War with Mexico.....	59,073,120.76		
Civil War.....	¹ 7,244,677,080.57	Total.....	7,950,354,932.29
War with Spain.....	386,748,031.08		

¹ Includes \$202 paid by direct Treasury settlements.

PENSIONS TABLE 5.—*Statement showing, by classes, the different monthly rates paid to pensioners under special acts of Congress, and the number at each rate on the roll June 30, 1929*

Rate	Regular Establishment		Civil War			War with Spain			War of 1812, wid-ows	War with Mexi-co, wid-ows	Indian Wars		World War sol-diers
	Sol-diers	Wid-ows, etc.	Sol-diers	Nur-ses	Wid-ows, etc.	Sol-diers	Nur-ses	Wid-ows, etc.			Sol-diers	Wid-ows, etc.	
\$6.....	28					3		1			4		
\$8.....	21	1	1			1					3		
\$10.....	23				4	1							
\$12.....	343	159	2		292	78	3	45		3	42	34	
\$14.....	7												
\$15.....	7	3			20	11		1					
\$16.....	1					1					1		
\$17.....	125	2				11					1		
\$18.....	13				13	9							
\$20.....	62	124	3		1,431	109	2	134	1	9	57	24	
\$22.....		1											
\$24.....	91	4	2		2	14					1		
\$25.....	1	37	1		102	13		7					
\$27.....	6												
\$30.....	73	51	17		3,081	48		42		19	11	35	2
\$35.....		21	1		29			7					
\$36.....	3					2							
\$40.....	30	44	3		900	10		12		2	5	5	
\$42.....					34								
\$45.....		1			18								
\$46.....					56								
\$48.....					1								
\$50.....	20	44	286	6	5,503	25		19			63		
\$52.....					31								
\$54.....					1								
\$55.....	1				3	2							
\$56.....					9								
\$57.....					2								
\$58.....					1								
\$60.....	3	1			53	2							
\$62.....					4								
\$65.....	1				3	1							
\$70.....					43								
\$72.....	5		1			9							
\$75.....		2			4			2					
\$80.....			1			1							
\$85.....						1							
\$90.....	1		1		2	1							
\$100.....		9			2								
\$125.....		2											
\$150.....		4				2		1					
\$208.33½.....		1											
\$250.....		1											
\$416.66⅔.....		2						1					
Total.....	865	514	319	6	11,644	355	5	272	1	33	188	98	2

PENSIONS TABLE 6.—*Disbursements for pensions and for maintenance of pension system 1866 to 1929*

Fiscal year	Paid as pensions	Cost, maintenance, and expenses ¹	Total	Number of pensioners
1866.....	\$15,450,549.88	\$407,165.00	\$15,857,714.88	126,722
1867.....	20,784,789.69	490,977.35	21,275,767.04	155,474
1868.....	23,101,509.36	553,020.34	23,654,529.70	169,643
1869.....	28,513,247.27	564,526.81	29,077,774.08	187,963
1870.....	29,351,488.78	600,997.86	29,952,486.64	198,686
1871.....	28,518,792.62	863,079.00	29,381,871.62	207,495
1872.....	29,752,746.81	951,253.00	30,703,999.81	232,229
1873.....	26,982,063.89	1,003,200.64	27,985,264.53	238,411
1874.....	30,206,778.99	966,794.13	31,173,573.12	236,241
1875.....	29,270,404.76	982,695.35	30,253,100.11	234,821
1876.....	27,936,209.53	1,015,078.81	28,951,288.34	232,137
1877.....	28,182,821.72	1,034,459.33	29,217,281.05	232,104
1878.....	26,786,009.44	1,032,500.09	27,818,509.53	223,998
1879.....	33,664,428.92	837,734.14	34,502,163.06	242,755
1880.....	56,689,229.08	935,027.28	57,624,256.36	250,802
1881.....	50,583,405.35	1,072,059.64	51,655,464.99	268,830
1882.....	54,313,172.05	1,466,236.01	55,779,408.06	285,697
1883.....	60,427,573.81	2,591,648.29	63,019,222.10	303,658
1884.....	57,912,387.47	2,835,181.00	60,747,568.47	322,756
1885.....	65,171,937.12	3,392,576.34	68,564,513.46	345,125
1886.....	64,091,142.90	3,245,016.61	67,336,159.51	365,787
1887.....	73,752,997.08	3,753,400.91	77,506,397.99	406,007
1888.....	78,950,501.67	3,515,057.27	82,465,558.94	452,553
1889.....	88,842,720.58	3,466,968.40	92,309,688.98	489,725
1890.....	106,093,850.39	3,526,382.13	109,620,232.52	537,944
1891.....	117,312,690.50	4,700,636.44	122,013,326.94	676,160
1892.....	139,394,147.11	4,898,665.80	144,292,812.91	876,068
1893.....	156,906,637.94	4,867,734.42	161,774,372.36	966,012
1894.....	139,986,726.17	3,963,976.31	143,950,702.48	969,544
1895.....	139,812,294.30	4,338,020.21	144,150,314.51	970,524
1896.....	138,220,704.46	3,991,375.61	142,212,080.07	970,678
1897.....	139,949,717.35	3,987,783.07	143,937,500.42	976,014
1898.....	144,651,879.80	4,114,091.46	148,765,971.26	993,714
1899.....	138,355,052.95	4,147,517.73	142,502,570.68	991,519
1900.....	138,462,130.65	3,841,706.74	142,303,837.39	993,592
1901.....	138,531,483.84	3,868,795.44	142,400,279.28	997,735
1902.....	137,504,267.99	3,831,378.96	141,335,646.95	999,446
1903.....	137,759,653.71	3,993,216.79	141,752,870.50	996,545
1904.....	141,093,571.49	3,849,366.25	144,942,937.74	994,762
1905.....	141,142,861.33	3,721,832.82	144,864,694.15	998,441
1906.....	139,000,288.25	3,523,269.51	142,523,557.76	985,971
1907.....	138,155,412.46	3,309,110.44	141,464,522.90	967,371
1908.....	152,093,086.27	2,800,963.36	155,894,049.63	951,687
1909.....	161,973,703.77	2,852,583.73	164,826,287.50	946,194
1910.....	159,974,056.08	2,657,673.86	162,631,729.94	921,083
1911.....	157,325,160.35	2,517,127.06	159,842,287.41	892,098
1912.....	152,986,433.72	2,448,857.31	155,435,291.03	860,294
1913.....	174,171,660.80	2,543,246.59	176,714,907.39	820,200
1914.....	172,417,546.26	2,066,507.15	174,484,053.41	785,239
1915.....	165,518,266.14	1,779,860.30	167,298,126.44	748,147
1916.....	159,155,089.92	1,656,722.33	160,811,812.25	709,572
1917.....	160,895,053.94	1,562,854.96	162,457,908.90	673,111
1918.....	179,835,328.75	1,527,615.61	181,362,944.36	646,895
1919.....	222,159,292.70	1,433,191.67	223,592,484.37	624,427
1920.....	213,295,314.65	1,395,014.09	214,690,328.74	592,190
1921.....	258,720,820.67	1,389,921.55	260,110,742.22	566,053
1922.....	253,807,583.37	1,394,079.47	255,201,662.84	547,016
1923.....	263,012,500.18	1,992,062.97	265,004,563.15	539,756
1924.....	229,994,777.60	1,497,698.53	231,492,476.13	525,539
1925.....	217,150,612.00	1,489,087.39	218,639,699.39	512,537
1926.....	207,844,348.29	1,436,001.05	209,280,349.34	501,723
1927.....	230,152,712.17	1,327,252.47	231,479,964.64	489,942
1928.....	228,965,672.49	1,214,565.95	230,180,238.44	491,194
1929.....	229,889,986.48	1,276,511.65	231,166,498.13	477,915

¹ Expenses of medical examinations and special field examinations not included.

PENSIONS TABLE 17.—Statement showing, by classes, the different monthly rates paid to pensioners under general pension laws and the number at each rate on the roll June 30, 1929

Rate	Regular Establishment		Civil War					War with Spain					Mexican War		Indian wars					
	Sol-diers	Wid-ows, etc.	Act May 1, 1920		Act July 3, 1926		Act May 23, 1928, widows	General laws		General laws		Act May 1, 1926		War of 1812 widows						
			Sol-diers	Wid-ows, etc.	Sol-diers	Wid-ows, etc.		Nurses	Sol-diers	Wid-ows, etc.	Sol-diers	Wid-ows, etc.	Nurses							
\$6	2,351																			
\$8	1,420	1																		
\$10	1,075																			
\$12	1,031	2,328						1	14											
\$14	405																			
\$15	146	29							7											
\$17	2,384	38																		
\$20	44	249																		
\$24	991	72																		
\$25	38	124							3											
\$30	1,790	237																		
\$40	32	32						3	95											
\$50	325	27																		
\$60	3	21																		
\$65	5							4												
\$72	254																			
\$75								16												
\$80	192							2												
\$90	147							140												
\$100	10							206												
\$125	48							56												
Total	13,681	3,158	28,291	56,415	30,903	13,257	99,373	430	546	33	1,049	1,248	177,374	27,032	409	10	1	697	5,386	3,902

In addition to the above there were on the roll 298 pensioners at miscellaneous rates ranging from \$2 to \$160 per month, and 60 pensioners of the World War, receiving from \$9 to \$100 per month.

NATIONAL PARKS

NATIONAL PARKS TABLE 1.—*National parks administered by the National Park Service*

[Number, 21; total area, 12,118 square miles]

Name	Location	When established	Area in square miles	Distinctive characteristics
Acadia ¹ 1919	Maine coast.....	{Feb. 26, 1919 Jan. 19, 1929 ²	16	{The group of granite mountains upon Mount Desert Island and also bold point on opposite mainland across Frenchmans Bay. Formerly called the Lafayette National Park.
Bryce Canyon ¹ 1928	Southwestern Utah.	{June 7, 1924 ³ Feb. 25, 1928 ² May 12, 1923 Sept. 15, 1928	23	{Box canyon filled with countless array of fantastically eroded pinnacles—Best exhibit of vivid coloring of earth's materials.
Crater Lake ¹ 1902	Southwestern Oregon.	{May 22, 1902	249	{Lake of extraordinary blue in crater of extinct volcano—Sides 1,000 feet high—Interesting lava formations—Fine fishing.
General Grant ¹ 1890	Middle eastern California.	Oct. 1, 1890	4	{Created to preserve the celebrated General Grant Tree, 40.3 feet in diameter—31 miles by trail from Sequoia National Park.
Glacier ¹ 1910	Northwestern Montana.	May 11, 1910	1,534	{Rugged mountain region of unsurpassed alpine character—250 glacier-fed lakes of romantic beauty—60 small glaciers—Precipices thousands of feet deep—Almost sensational scenery of marked individuality—Fine trout fishing.
Grand Canyon ¹ 1919	North central Arizona.	{Feb. 26, 1919 Feb. 25, 1927 ² Mar. 7, 1928 ²	1,009	{The greatest example of erosion and the most sublime spectacle in the world.
Grand Teton ¹ 1929	Northwestern Wyoming.	{Feb. 26, 1929	150	{Includes spectacular Teton Mountains, a granite uplift of unusual grandeur.
Hawaii ¹ 1916	Hawaii.....	{Aug. 1, 1916 May 1, 1922 ² Feb. 12, 1927 ² Apr. 11, 1928 ²	245	{Interesting volcanic areas—Kilauea and Mauna Loa, active volcanoes on the island of Hawaii; Haleakala, a huge extinct volcano on the island of Maui.
Hot Springs ¹ 1921	Middle Arkansas.	{Mar. 4, 1921	1½	{46 hot springs said to possess healing properties—Many hotels and boarding houses—19 bathhouses under Government supervision. Reserved by Congress in 1832 as the Hot Springs Reservation to prevent exploitation of hot waters.
Lassen Volcanic ¹ 1916	Northern California.	{Aug. 9, 1916 Apr. 26, 1928 ² May 21, 1928 Jan. 19, 1929 ²	163	{Only active volcano in United States proper—Lassen Peak, 10,460 feet—Cinder cone, 6,907 feet—Hot springs—Mud geysers.
Mesa Verde ¹ 1906	Southwestern Colorado.	{June 29, 1906 June 30, 1913 ²	80	{Most notable and best preserved prehistoric cliff dwellings in United States, if not in the world.
Mount McKinley ¹ 1917	South central Alaska.	{Feb. 26, 1917 Jan. 30, 1922 ²	2,645	{Highest mountain in North America—Rises higher above surrounding country than any other mountain in the world.
Mount Rainier ¹ 1899	West central Washington.	{Mar. 2, 1899 May 28, 1926	325	{Largest accessible single peak glacier system; 28 glaciers, some of large size; 48 square miles of glacier, 50 to 500 feet thick—Wonderful subalpine wild-flower fields.
Platt..... 1902	Southern Oklahoma.	{July 1, 1902 Apr. 21, 1904 June 29, 1906 Jan. 26, 1915 ²	1½	{Sulphur and other springs possessing medicinal value.
Rocky Mountain ¹ 1915	North middle Colorado.	{Feb. 14, 1917 June 2, 1924 ² June 9, 1926	378	{Heart of the Rockies—Snowy range, peaks 11,000 to 14,255 feet altitude—Remarkable records of glacial period.
Sequoia ¹ 1890	Middle eastern California.	{Sept. 25, 1890 July 3, 1926	604	{The Big Tree National Park—Scores of Sequoias 20 to 30 feet in diameter, thousands over 10 feet in diameter—General Sherman Tree, 37.3 feet in diameter and 273.9 feet high—Towering mountain ranges—Startling precipices—Mount Whitney and Kern River country.

¹ General information circulars on these parks may be obtained free on application.

² Boundary changed.

³ Date acquisition private land as provided by act of June 7, 1924.

NATIONAL PARKS TABLE 1.—*National parks administered by the National Park Service—Continued*

Name	Location	When established	Area in square miles	Distinctive characteristics
Sullys Hill..... 1904	North Dakota.	Apr. 27, 1904	1½	Small park with woods, streams, and a lake—Is a wild-animal preserve.
Wind Cave ¹ 1903	South Dakota.	Jan. 9, 1903	17	Cavern having several miles of galleries and numerous chambers containing peculiar formations.
Yellowstone ¹ 1872	Northwestern Wyoming southwestern Montana, and northeastern Idaho.	Mar. 1, 1872 Mar. 1, 1929 ²	4 3,426	More geysers than in all rest of world together—Boiling springs—Mud volcanoes—Petriified forests—Grand Canyon of the Yellowstone, remarkable for gorgeous coloring—Large lakes—Many large streams and waterfalls—Vast wilderness, one of the greatest wild bird and animal preserves in the world—Exceptional trout fishing.
Yosemite ¹ 1890	Middle eastern California.	{Oct. 1, 1890 May 28, 1923 ²	1,126	{Valley of world-famed beauty—Lofty cliffs—Romantic vistas—Many waterfalls of extraordinary height—3 groves of Big Trees—High Sierra—Waterwheel Falls—Good trout fishing.
Zion ¹ 1919	Southwestern Utah.	Nov. 19, 1919	120	Magnificent gorge (Zion Canyon) depth from 1,500 to 2,500 feet, with precipitous walls—Of great beauty and scenic interest.

¹ General information circulars on these parks may be obtained free on application.² In Wyoming, 3,145 square miles; in Montana, 245 square miles; in Idaho, 36 square miles.⁴ In Wyoming, 3,145 square miles; in Montana, 245 square miles; in Idaho, 36 square miles.NATIONAL PARKS TABLE 2.—*National military and other parks administered by the War Department*

[Number, 11; total area, 21 square miles or 14,062 acres]

Name	Location	When established	Area (acres)	Description
Antietam Battle Field...	Maryland.....	Aug. 30, 1890	40	Scene of one of the greatest battles of the Civil War.
Chickamauga and Chattanooga.	Georgia and Tennessee.	Aug. 19, 1890	6,542	Beautiful natural park; embraces battle fields of Chickamauga and Missionary Ridge and scenes of other conflicts of the Civil War fought in the vicinity of Chattanooga during 1863.
Fredericksburg and Spotsylvania.	Virginia.....	Feb. 14, 1927	(¹)	Scene of battles of Fredericksburg, Spotsylvania, Wilderness, Chancellorsville, and Salem Church at or near Fredericksburg.
Fort Donelson.....	Tennessee.....	Mar. 26, 1928	(¹)	Site of Civil War fort—now military cemetery.
Gettysburg ²	Pennsylvania....	Feb. 11, 1895	2,317	Beautiful natural park; scene of Civil War combat; probably better marked than any other battle field in the world.
Guilford Courthouse.....	North Carolina.	Mar. 2, 1917	110	Near Greensboro; scene of one of the great battles of the Revolution; fought in 1781.
Moore's Creek.....	do.....	June 2, 1926	30	Scene of one of most memorable battles of Revolutionary War.
Petersburg.....	Virginia.....	July 3, 1926	185	Scene of campaign and siege and defense of Petersburg, Va., in 1864 and 1865.
Shiloh.....	Tennessee.....	Dec. 27, 1894	3,584	Natural park embracing the battle field of Shiloh near Pittsburg Landing.
Stones River.....	do.....	Mar. 3, 1927	(¹)	Scene of the battle of Stones River in Tennessee.
Vicksburg.....	Mississippi.....	Feb. 21, 1899	1,324	Beautiful natural park; scene of the siege and surrender of Vicksburg in 1863 during the Civil War.

¹ Undetermined.² Donated in whole or in part to the United States.

NATIONAL PARKS TABLE 3.—*National monuments administered by the National Park Service*

[Number, 33; total area, 3,728 square miles]

Name	Location	When established	Area (acres)	Description
Arches.....	Utah.....	Apr. 12, 1929	4,520	Contains extraordinary examples of wind erosion in the shape of gigantic arches, windows, and other unique formations.
Aztec Ruins ¹	New Mexico.....	{Jan. 24, 1923 July 2, 1928 }	17½	{Prehistoric ruin of pueblo type containing 500 rooms and other ruins.
Capulin Mountain.....	do.....	Aug. 9, 1916	680	{Cinder cone of geologically recent formation.
Carlsbad Cave.....	do.....	Oct. 25, 1923	719	{Beautifully decorated limestone cavern, believed to be largest yet discovered.
Casa Grande.....	Arizona.....	{June 22, 1892 ² Dec. 10, 1909 Aug. 3, 1918 June 7, 1926 }	472	{These ruins are one of the most noteworthy relics of a prehistoric age and people within the limits of the United States. Discovered in ruinous condition in 1694.
Chaco Canyon.....	New Mexico.....	{Mar. 11, 1907 Jan. 10, 1928 }	21,512	{Numerous cliff-dweller ruins, including communal houses, in good condition, and but little excavated.
Colorado.....	Colorado.....	May 24, 1911	13,749	{Many lofty monoliths, and is wonderful example of erosion, and of great scenic beauty and interest.
Craters of the Moon.....	Idaho.....	{May 2, 1924 July 23, 1928 }	49,565	{Best example of fissure lava flows; volcanic region with weird landscape effects.
Devils Tower.....	Wyoming.....	Sept. 24, 1906	1,153	{Remarkable natural rock tower, of volcanic origin, 1,200 feet in height.
Dinosaur.....	Utah.....	Oct. 4, 1915	80	{Deposits of fossil remains of prehistoric animal life of great scientific interest.
El Morro.....	New Mexico.....	{Dec. 8, 1906 June 18, 1917 }	240	{Enormous sandstone rock eroded in form of a castle, upon which inscriptions have been placed by early Spanish explorers. Contains cliff-dweller ruins. Of great historic, scenic, and ethnologic interest.
Fossil Cycad.....	South Dakota.....	Oct. 21, 1922	320	{Area containing deposits of fossil plants.
Glacier Bay.....	Alaska.....	Feb. 26, 1925	1,164,800	{Contains tidewater glaciers of first rank. One of the most important of earliest Spanish mission ruins in the Southwest. Monument also contains pueblo ruins.
Gran Quivira.....	New Mexico.....	{Nov. 1, 1909 Nov. 25, 1919 }	424	{Four groups of prehistoric towers, pueblos, and cliff dwellings.
Hovenweep.....	Utah-Colorado.....	Mar. 2, 1923	236	{Wonderland of great scientific interest in the study of volcanism. Phenomena exist upon a scale of great magnitude. Includes Valley of Ten Thousand Smokes.
Katmai.....	Alaska.....	{Sept. 24, 1918 Sept. 5, 1923 }	1,087,990	{Immense limestone cavern of great scientific interest, magnificently decorated with stalactite formations. Now closed to public because of depredations by vandals.
Lewis and Clark Cavern. ¹	Montana.....	{May 11, 1908 May 16, 1911 }	160	{Prehistoric cliff-dwelling ruin of unusual size situated in a niche in face of a vertical cliff. Of scenic and ethnologic interest.
Montezuma Castle.....	Arizona.....	Dec. 8, 1906	160	{One of the most noted redwood groves in California, and was donated by Hon. William Kent, ex-Member of Congress. Located 7 miles from San Francisco.
Muir Woods ¹	California.....	{Jan. 9, 1908 Sept. 22, 1921 }	426	{Three natural bridges, among largest examples of their kind. Largest bridge is 222 feet high, 65 feet thick at top of arch; arch is 28 feet wide; span, 261 feet; height of span, 157 feet. Other two slightly smaller.
Natural Bridges.....	Utah.....	{Apr. 16, 1908 Sept. 25, 1909 Feb. 11, 1916 }	2,740	{Contains numerous pueblo, or cliff-dweller ruins, in good preservation.
Navajo.....	Arizona.....	{Mar. 20, 1909 Mar. 14, 1912 }	360	{Splendid collection of characteristic desert flora and numerous pictographs. Interesting rock formations.
Papago Saguaro.....	do.....	{Jan. 31, 1914 Dec. 23, 1922 }	1,940	{Abundance of petrified coniferous trees, one of which forms a small natural bridge. Is of great scientific interest.
Petrified Forest.....	do.....	{Dec. 8, 1906 July 31, 1911 }	25,908	

¹ Donated to the United States.² From June 22, 1892, until Aug. 3, 1918, classified as a national park.³ Estimated.

NATIONAL PARKS TABLE 3.—*National monuments administered by the National Park Service—Continued*

[Number, 33; total area, 3,728 square miles]

Name	Location	When established	Area (acres)	Description
Pinnacles.....	California.....	{ Jan. 16, 1908 May 7, 1923 July 2, 1924 }	2,980	{ Many spirelike rock formations, 600 to 1,000 feet high, visible many miles; also numerous caves and other formations.
Pipe Spring.....	Arizona.....	May 31, 1923	40	Old stone fort and spring of pure water in desert region. Serves as memorial to early western pioneer life.
Rainbow Bridge..	Utah.....	May 30, 1910	160	Unique natural bridge of great scientific interest and symmetry. Height 309 feet above water, and span is 278 feet, in shape of rainbow.
Scotts Bluff.....	Nebraska.....	{ Dec. 12, 1919 May 9, 1924 }	1,894	{ Region of historic and scientific interest. Many famous old trails traversed by the early pioneers in the winning of the West passed over and through this monument.
Shoshone Cavern..	Wyoming.....	Sept. 21, 1909	210	Cavern of considerable extent, near Cody.
Sitka.....	Alaska.....	Mar. 23, 1910	57	Park of great natural beauty and historic interest as scene of massacre of Russians by Indians. Contains 16 totem poles of best native workmanship.
Tumacacori.....	Arizona.....	Sept. 15, 1908	10	Ruin of Franciscan mission dating from seventeenth century. Being restored by National Park Service as rapidly as funds permit.
Verendrye.....	North Dakota..	June 29, 1917	250	Includes Crowhigh Butte, from which Explorer Verendrye first beheld territory beyond the Missouri River.
Wupatki.....	Arizona.....	Dec. 9, 1924	2,234	Prehistoric dwellings of ancestors of Hopi Indians.
Yucca House ¹	Colorado.....	Dec. 19, 1919	9½	Located on eastern slope of Sleeping Ute Mountain. Is pile of masonry of great archeological value, relic of prehistoric inhabitants.

¹ Donated to the United States.NATIONAL PARKS TABLE 4.—*National monuments administered by the Department of Agriculture*

[Number, 15; total area, 591 square miles]

Name	Location	Date of creation	Area (acres)	Description
Bandelier.....	New Mexico..	Feb. 11, 1916	22,075	Vast number of cliff-dweller ruins, with artificial caves, stone sculpture, and other relics of prehistoric life.
Chiricahua.....	Arizona.....	Apr. 18, 1924	4,480	Natural rock formations within Coronado National Forest.
Devils Postpile..	California.....	July 6, 1911	800	Spectacular mass of hexagonal basaltic columns, like an immense pile of posts. Said to rank with famous Giant's Causeway in Ireland.
Gila Cliff Dwellings.	New Mexico..	Nov. 16, 1907	160	Numerous cliff-dweller ruins of much interest and in good preservation.
Holy Cross.....	Colorado.....	May 11, 1929	1,392	Figure in the form of a Greek cross may be seen on the side of the Mount of the Holy Cross.
Jewel Cave.....	South Dakota..	Feb. 7, 1908	11,280	Limestone cavern of much beauty and considerable extent, limits of which are as yet unknown.
Lava Beds.....	California.....	Nov. 21, 1925	45,967	Interesting ice caves. Battleground of Modoc Indian War, 1873.
Lehman Caves....	Nevada.....	Jan. 24, 1922	593	Limestone caverns of much beauty and of scientific interest and importance.
Mount Olympus..	Washington...	{ Mar 2, 1909 Apr. 17, 1912 May 11, 1915 }	298,730	{ Contains many objects of great and unusual scientific interest, including many glaciers. Is summer range and breeding ground of the Olympic elk.

¹ Estimated.

NATIONAL PARKS TABLE 4.—*National monuments administered by the Department of Agriculture—Continued*

Name	Location	Date of creation	Area (acres)	Description
Old Kasaan.....	Alaska.....	Oct. 25, 1916	38	Abandoned Indian village in which there are numerous remarkable totem poles and other objects of historical interest.
Oregon Caves.....	Oregon.....	July 12, 1909	480	Extensive caves in limestone formation of much beauty; magnitude not entirely ascertained.
Timpanogos Cave.	Utah.....	Oct. 14, 1922	250	Limestone cavern.
Tonto.....	Arizona.....	Dec. 19, 1907	1 640	Numerous cliff-dweller ruins of much interest and in good preservation.
Walnut Canyon...	Arizona.....	Nov. 30, 1915	960	Contains cliff dwellings of much scientific and popular interest.
Wheeler.....	Colorado.....	Dec. 7, 1908	300	Of much interest from geological standpoint as example of eccentric erosion and volcanic action. Of much scenic beauty.

¹ Estimated.NATIONAL PARKS TABLE 5.—*National monuments administered by the War Department*

[Number, 16; total area, 642 acres]

Name	Location	Date of creation	Area (acres)	Description
Abraham Lincoln's Birthplace.	Kentucky.....	July 17, 1916	110	Contains the log cabin and part of the farm where Abraham Lincoln was born.
Big Hole Battle Field.	Montana.....	June 23, 1910	5	Site of battle field on which battle was fought Aug. 9, 1877, between a small force of United States troops and a much larger force of Nez Perce Indians, resulting in rout for the Indians.
Cabrillo.....	California.....	{Oct. 14, 1913} {May 12, 1926}	½	{Of historic interest because of discovery of the territory now partly embraced in the State of California by Juan Rodriguez Cabrillo, who at this point first sighted land on Sept. 28, 1542.
Castle Pinckney..	South Carolina	Oct. 15, 1924	3½	Fortification built in 1810 to replace a Revolutionary fort.
Chalmette.....	Louisiana.....	May 24, 1907	17	Erected in memory of the Battle of New Orleans, which was fought on Jan. 8, 1815.
Fort Marion.....	Florida.....	Oct. 15, 1924	18	Fort built by Spaniards in 1656.
Fort Matanzas...	do.....	do.....	1	Relic of Spanish invasion.
Fort McHenry....	Maryland.....	Mar. 3, 1925	47	Restored and preserved as birthplace of "Star-Spangled Banner."
Fort Niagara.....	New York.....	Sept. 5, 1925	.0074	Site for erection of cross to commemorate a cross erected by Father Millett in 1688 on what is now the Fort Niagara Military Reservation.
Fort Pulaski.....	Georgia.....	Oct. 15, 1924	20	Built in 1810 to replace Fort Greene of the Revolution.
Fort Wood.....	New York.....	do.....	2½	Site of the Statue of Liberty.
Kennesaw Mountain.	Georgia.....	Feb. 15, 1928	60	Site of important Civil War engagement fought June 27, 1864.
Kitty Hawk.....	North Carolina.	Mar. 2, 1927	None.	Scene of first sustained flight by heavier-than-air machine.
Mcriwether Lewis.	Tennessee.....	Feb. 6, 1925	300	Contains grave of Captain Lewis of the Lewis and Clark Expedition.
Mound City Group.	Ohio.....	Mar. 2, 1923	57	Famous group of prehistoric mounds in Camp Sherman Military Reservation.
White Plains Battle Field.	New York.....	May 18, 1926	None.	Memorial tablet to indicate the position of the Revolutionary Army under the command of General Washington.

NATIONAL PARKS TABLE 6.—*Visitors to national parks, 1914-1929*

Name of park	1914	1915	1916	1917	1918	1919	1920	1921
Acadia ¹						² 64,000	² 66,500	² 69,836
Crater Lake.....	7,096	11,371	12,265	11,645	13,231	16,645	20,135	28,617
General Grant.....	3,735	10,523	15,360	17,390	15,496	21,574	19,661	30,312
Glacier.....	14,168	14,265	12,839	18,387	9,086	18,956	22,449	19,736
Grand Canyon.....						37,745	67,315	67,485
Hawaii.....			(³)	(³)	(³)	(³)	(³)	² 16,071
Hot Springs.....	² 125,000	² 115,000	² 118,740	² 135,000	² 140,000	² 160,490	² 162,850	² 130,968
Lassen Volcanic.....			(³)	² 8,500	² 2,000	² 2,500	² 2,000	² 10,000
Mesa Verde.....	502	663	1,385	2,223	2,058	2,287	2,890	3,003
Mount McKinley.....			(³)	(³)	(³)	(³)	(³)	(³)
Mount Rainier.....	15,038	35,166	23,989	35,568	43,901	55,232	56,491	55,771
Platt.....	² 30,000	² 20,000	² 30,000	² 35,090	14,431	26,312	27,023	² 60,000
Rocky Mountain.....		² 31,000	² 51,000	117,186	101,497	169,492	240,966	² 273,737
Sequoia.....	4,667	7,647	10,780	18,510	15,001	30,443	31,508	28,263
Sullys Hill.....	² 500	² 1,000	² 1,500	2,207	4,188	4,026	9,341	9,100
Wind Cave.....	3,592	2,817	² 9,000	16,742	² 36,000	² 25,000	² 38,000	28,336
Yellowstone.....	20,250	51,895	35,849	35,400	21,275	62,261	79,777	81,651
Yosemite.....	15,145	33,452	33,390	34,510	33,497	58,362	68,906	91,513
Zion.....							3,692	2,937
Total.....	235,193	334,799	356,097	488,268	451,661	755,325	919,504	1,007,335

Name of park	1922	1923	1924	1925	1926	1927	1928	1929
Acadia ¹	73,779	64,200	71,758	73,673	101,256	123,699	134,897	149,554
Bryce Canyon.....								21,997
Crater Lake.....	33,016	52,017	64,312	65,018	86,019	82,354	113,323	128,435
General Grant.....	50,456	46,230	35,020	40,517	50,597	47,996	51,988	44,783
Glacier.....	23,935	3,988	33,372	40,063	37,325	41,745	53,454	70,742
Grand Canyon.....	84,700	102,166	108,256	134,053	140,252	162,356	167,226	184,093
Grand Teton.....								² 51,500
Hawaii.....	27,750	41,150	52,110	64,155	² 35,000	37,551	78,414	109,857
Hot Springs.....	² 106,164	² 112,000	² 164,175	² 265,500	² 260,000	² 181,523	² 199,099	184,517
Lassen Volcanic.....	² 10,000	² 9,500	² 12,000	² 12,956	18,739	20,089	26,057	26,106
Mesa Verde.....	4,251	5,236	7,109	9,043	11,356	11,915	16,760	14,517
Mount McKinley.....	⁵ 7	⁵ 34	⁵ 62	⁵ 206	⁵ 533	⁵ 651	⁵ 802	1,038
Mount Rainier.....	70,371	123,708	161,473	173,004	161,796	200,051	219,531	217,783
Platt.....	² 70,000	² 117,710	² 134,874	² 143,380	² 124,284	² 294,954	² 280,638	² 204,598
Rocky Mountain.....	⁴ 219,164	218,000	224,211	233,912	² 225,027	² 229,862	² 235,057	² 274,408
Sequoia.....	27,514	30,158	34,468	46,677	89,404	100,684	98,035	111,385
Sullys Hill.....	² 9,548	8,478	8,035	9,183	19,921	22,632	24,979	21,004
Wind Cave.....	31,016	41,505	52,166	69,267	85,466	81,023	100,309	108,943
Yellowstone.....	98,223	138,352	144,158	154,282	187,807	200,825	230,984	260,697
Yosemite.....	100,506	130,046	105,894	209,166	274,209	490,430	460,619	461,251
Zion.....	4,109	6,408	8,400	16,817	21,964	24,303	30,016	33,383
Total.....	1,044,502	1,280,886	1,422,353	1,760,512	1,930,865	2,354,643	2,522,188	2,680,597

¹ Formerly Lafayette National Park.² Estimated.³ No record.⁴ Indicated loss in travel from 1921 due largely to better method of checking and estimating employed.⁵ Actual park visitors; some miners and prospectors also passed through park.

NATIONAL PARKS TABLE 7.—*Visitors to the national monuments in 1924-1929*¹

Name	1924	1925	1926	1927	1928	1929
Arches (Utah).....						² 500
Aztec Ruins (New Mexico).....	5,968	² 7,000	5,646	7,298	18,359	18,193
Capulin Mountain (New Mexico).....	² 7,000	² 7,000	14,965	12,617	² 7,600	² 12,000
Carlsbad Cave (New Mexico).....	³ 1,280	1,794	10,904	26,436	46,335	76,822
Casa Grande (Arizona).....	9,583	13,587	16,542	28,818	28,274	37,244
Chaco Canyon (New Mexico).....		² 2,000	2,500	² 1,500	1,425	² 2,750
Colorado (Colorado).....	² 8,000	² 9,000	² 9,000	² 9,500	² 10,000	² 12,000
Craters of the Moon (Idaho).....		3,349	4,620	5,771	7,768	7,730
Devils Tower (Wyoming).....	² 7,800	8,450	16,640	² 10,400	² 8,000	² 12,000
El Morro (New Mexico).....	² 3,200	² 1,800	5,794	5,178	5,356	2,625
Gran Quivira (New Mexico).....		² 1,000	1,577	2,034	2,779	3,357
Hovenweep (Utah-Colorado).....		² 250	² 250	² 263	² 240	² 450
Katmai (Alaska).....	17					
Montezuma Castle (Arizona).....	² 7,500	² 9,000	12,385	15,400	16,232	17,824
Muir Woods (California).....	92,391	93,643	97,426	101,514	103,571	93,358
Natural Bridges (Utah).....	62		68	82	175	² 260
Navajo (Arizona).....	85	200	² 250	² 260	315	965
Papago Saguaro (Arizona).....	² 10,000	² 30,000	² 53,000	60,540	66,450	² 87,600
Petrified Forest (Arizona).....	42,781	55,227	53,345	61,761	75,225	69,350
Pinnacles (California).....	8,973	² 10,000	10,167	11,265	13,216	10,756
Pipe Spring (Arizona).....		² 4,000	16,728	16,853	17,321	24,883
Rainbow Bridge (Utah).....	115	250	² 300	² 300	² 200	² 450
Scotts Bluff (Nebraska).....	² 35,000	² 24,000	² 27,000	² 30,000	² 37,500	² 42,500
Shoshone Cavern (Wyoming).....					² 300	
Sitka (Alaska).....			² 2,500	² 3,000	² 3,000	² 3,500
Tumacacori (Arizona).....	² 8,800	² 10,500	13,683	16,761	17,341	18,250
Verendrye (North Dakota).....		² 1,400	² 8,000	² 15,000	² 15,000	² 11,000
Wupatki (Arizona).....		² 500	² 600	² 450	² 500	² 550
Yucca House (Colorado).....		² 100	² 150	196	174	² 250
Total.....	248,555	294,050	384,040	443,197	502,656	567,667

¹ No records for other national monuments.² Estimated.³ Opened to public June 1, 1924.NATIONAL PARKS TABLE 8.—*Private automobiles entering the national parks during seasons 1922-1929*¹

Name of park	1922	1923	1924	1925	1926	1927	1928	1929
Acadia ^{2 3}	8,650	8,600	12,561	9,381	15,361	29,181	31,998	35,972
Bryce Canyon.....								5,223
Crater Lake.....	9,429	15,377	19,301	19,451	26,442	25,667	34,869	39,043
General Grant.....	12,010	12,036	9,118	11,108	12,869	13,172	14,681	12,995
Glacier.....	2,416	5,599	6,756	7,585	6,727	7,980	9,860	14,320
Grand Canyon.....	7,890	11,731	13,052	19,910	22,849	28,479	32,316	37,848
Grand Teton.....								⁴ 16,200
Hawaii ²		8,025	10,150	12,650	⁴ 6,500	8,345	14,505	18,347
Hot Springs ²						⁵ 1,559	⁶ 1,455	28,290
Lassen Volcanic ²				2,646	5,423	5,899	8,137	8,370
Mesa Verde.....	969	1,255	1,803	2,197	3,054	3,315	4,803	4,224
Mount Rainier.....	17,149	27,655	38,351	39,860	38,626	48,275	50,005	51,998
Platt ²	⁴ 30,000	⁴ 50,000	⁴ 57,400	⁴ 60,000	45,796	⁴ 75,000	⁴ 70,000	⁴ 65,000
Rocky Mountain ²	⁴ 52,112	⁴ 51,800	⁴ 53,696	⁴ 58,057	⁴ 50,407	⁴ 54,109	⁴ 57,381	67,682
Sequoia ⁶	7,886	9,796	11,032	14,273	26,503	30,165	29,290	33,250
Sullys Hill ²				2,271	4,484	⁴ 4,700	5,229	4,936
Wind Cave ²	10,096	13,570	17,200	22,598	28,332	26,879	33,300	36,317
Yellowstone.....	18,253	27,359	30,689	33,068	⁶ 44,326	49,055	58,186	68,415
Yosemite.....	19,583	27,233	32,814	49,229	74,885	137,296	131,689	132,903
Zion.....	662	1,446	1,993	3,928	4,796	6,203	7,532	8,612
Total.....	197,105	271,482	315,916	368,212	417,386	557,079	595,236	689,945

¹ Automobiles entering parks with or without licenses, to and including Sept. 30, 1929.² No license required.³ Formerly Lafayette National Park.⁴ Estimated.⁵ Count made only at public camp ground.⁶ License required only for Giant Forest Road.

NATIONAL PARKS TABLE 12.—*Summary of appropriations for the administration, protection, and improvement of the national parks and national monuments, together with the revenues received, for the fiscal years 1917¹–1930, inclusive*

Year	Department	Appropriation		Revenues
1917	Interior Department.....	\$537,366.67		
	War Department.....	247,200.00		
			\$784,566.67	\$180,652.30
1918	Interior Department.....	530,680.00		
	War Department.....	217,500.00		
			748,180.00	² 217,330.55
1919	Interior Department.....	963,105.00		
	War Department.....	50,000.00		
			1,013,105.00	196,678.03
1920	.....		907,070.76	316,877.96
1921	.....		1,058,969.16	396,928.27
1922	.....		1,433,220.00	432,964.89
1923	.....		1,446,520.00	513,706.36
1924	.....		1,892,601.00	663,886.32
1925	.....		3,027,657.00	670,920.98
1926	.....		3,258,409.00	826,454.17
1927	.....		3,698,920.00	703,849.60
1928	.....		4,889,685.00	808,255.81
1929	.....		4,754,015.00	849,272.95
1930	.....		7,598,440.00	-----

¹ For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.

² The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

RECEIPTS AND EXPENDITURES IN THE TERRITORY OF ALASKA, 1925-1928

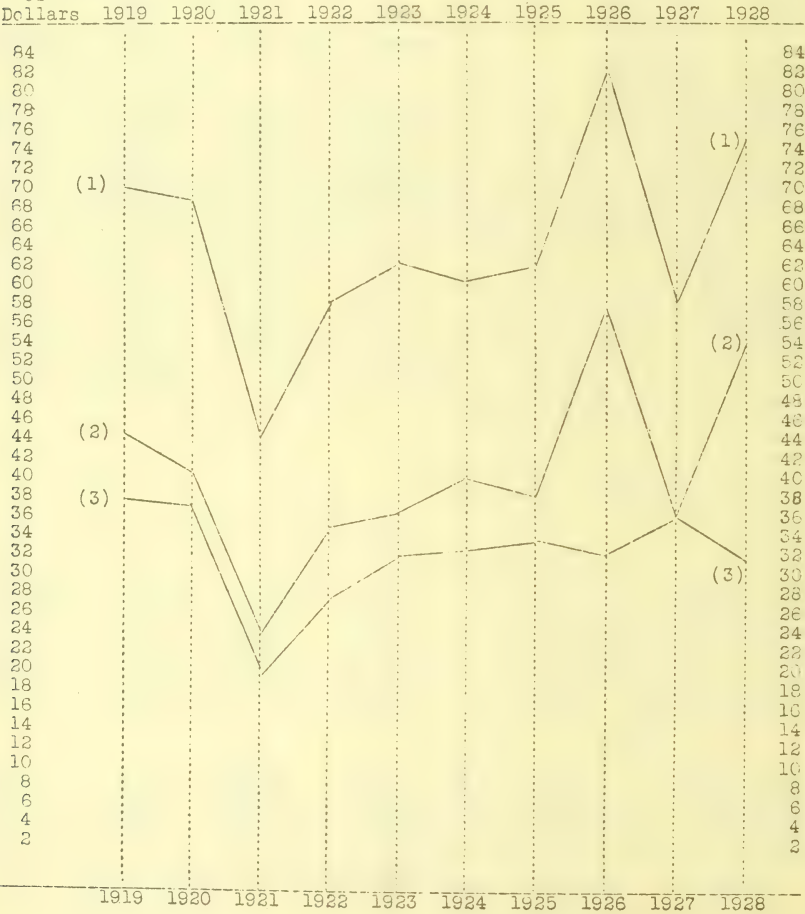
Activity	Period			
	1925		1926	
	Receipts	Expenditures	Receipts	Expenditures
War Department.....	\$81,578.45	\$2,582,899.45	\$155,308.99	\$2,044,580.11
Navy Department.....		171,787.88		247,592.96
Agriculture.....	150,068.04	777,327.37	129,155.04	941,068.29
Department of Labor.....	1,227.00	11,936.09	1,295.50	12,691.28
Treasury.....	567,208.15	382,504.13	711,351.29	380,262.17
Commerce.....	349,174.83	1,265,357.17	180,607.42	1,184,189.82
Post Office Department.....	70,965.36	771,221.59	77,563.18	774,535.90
Department of Justice.....	399,346.94	638,453.99	365,809.63	633,127.85
INTERIOR				
National Parks.....	68.93	11,909.89	135.45	14,087.86
Geological Survey.....		94,384.64		94,691.02
Education.....	2,888.22	545,977.05	50,801.53	575,585.61
General Land.....	33,290.19	81,629.72	21,197.90	73,718.10
Alaska R. R.....	861,374.13	2,836,559.14	1,067,511.87	2,831,681.46
Chief clerk.....	49,288.34	301,224.71	47,311.00	216,081.55
Total.....	2,566,478.58	10,473,173.42	2,808,048.80	10,023,893.98

Activity	Period			
	1927		1928	
	Receipts	Expenditures	Receipts	Expenditures
War Department.....	\$91,695.82	\$1,881,988.36	\$230,730.17	\$1,809,458.53
Navy Department.....		224,329.74		209,864.52
Agriculture.....	257,706.53	881,357.83	151,197.18	916,673.01
Department of Labor.....	1,371.00	12,191.88	1,230.00	15,152.00
Treasury.....	557,534.68	387,632.20	527,022.14	505,397.15
Commerce.....	285,249.27	1,157,079.03	306,163.39	1,258,100.21
Post Office Department.....	81,311.96	762,559.38	90,196.58	771,224.96
Department of Justice.....	429,320.66	609,136.38	343,478.04	673,769.52
INTERIOR				
National Parks.....	45.68	18,867.15	63.04	22,490.00
Geological Survey.....		70,963.93		75,308.00
Education.....	16,996.73	638,466.59	7,409.31	675,573.76
General Land.....	29,028.44	69,688.66	32,038.85	81,103.90
Alaska R. R.....	1,333,682.88	2,691,670.74	1,451,734.64	2,719,343.48
Chief clerk.....	59,668.66	274,019.87	39,197.07	241,960.51
Total.....	3,143,612.31	9,679,951.74	3,180,460.41	9,975,419.55

Graph showing:

- 1. Total shipments of all commodities, Alaska to United States.
- 2. Shipments of fish & fish products, Alaska to United States.
- 3. Total shipments of all commodities, United States to Alaska.

Millions
of



Graph showing values of certain products shipped from
Alaska to United States during the past ten years.

(A) - Fish and fish products.

(B) - Copper

(C) - Gold & Silver



Merchandise and gold and silver shipped from Alaska to United States

Articles	Unit	1927		1928	
		Quantity	Value	Quantity	Value
Fish:					
Fresh and frozen—					
Halibut.....	Pound.....	17, 111, 185	\$2, 282, 684	13, 194, 868	\$1, 686, 401
Salmon.....	do.....	5, 502, 929	674, 796	5, 959, 105	733, 463
All other.....	do.....	730, 404	55, 419	723, 743	52, 997
Canned, salmon.....	do.....	180, 554, 424	27, 223, 447	286, 981, 255	45, 548, 683
Cured or preserved—					
Cod.....	do.....	2, 976, 567	210, 981	1, 165, 190	79, 031
Herring.....	do.....	14, 509, 018	1, 460, 207	18, 389, 589	1, 674, 244
Salmon.....	do.....	8, 465, 332	1, 859, 358	5, 639, 415	1, 180, 335
All other.....	do.....	550	55	18, 790	1, 416
Shellfish—					
Clams.....	do.....	627, 032	159, 751	354, 706	104, 916
Crabs.....	do.....	95, 734	38, 135	157, 164	58, 777
Shrimps.....	do.....	494, 572	199, 922	492, 347	196, 164
Other fish products—					
Fertilizer.....	Ton.....	252	12, 100	97	5, 508
Meal.....	do.....	6, 375	413, 986	9, 051	664, 296
Oil.....	Gallon.....	2, 033, 236	855, 918	2, 569, 439	1, 073, 454
All other fish and fish products.....	Pound.....	25, 821	1, 608	126, 588	10, 987
Total fish.....			35, 448, 367		53, 070, 672
Whale oil.....	Gallon.....	947, 514	219, 135	725, 506	253, 799
Animals.....	Number.....	1, 295	74, 261	880	52, 410
Curios.....	do.....	7, 243	16, 062	5, 118	21, 243
Furs and fur skins: ¹					
Seal.....	do.....	25, 369	506, 912	31, 829	631, 141
Blue fox.....	do.....	11, 021	681, 253	8, 620	611, 364
Silver or black fox.....	do.....	1, 085	129, 462	869	102, 885
Red fox.....	do.....	21, 915	606, 806	27, 729	935, 614
White fox.....	do.....	3, 720	117, 677	4, 649	203, 331
Mink.....	do.....	45, 466	674, 921	31, 067	490, 050
Muskrat.....	do.....	155, 041	291, 626	203, 857	249, 984
Beaver.....	do.....	9, 840	253, 774	29, 774	759, 822
All other.....	do.....	44, 471	1, 002, 716	33, 031	663, 643
Manufactured furs.....	do.....	134	20, 979	76	16, 735
Ore, matte, and regulus:	Gross.....				
Copper.....	Ton.....	88, 848		69, 145	
	Pound.....	61, 463, 693	8, 509, 878	45, 349, 973	6, 781, 655
Lead.....	Ton.....	1, 687		1, 874	
	Pound.....	1, 975, 089	132, 974	2, 103, 750	130, 321
Tin ore and concentrates.....	do.....	73, 750	30, 886	91, 065	42, 595
Reindeer meat.....	do.....	819, 931	63, 506	1, 318, 453	153, 723
Stone, including marble.....	Ton.....	3, 950	119, 516	32, 575	123, 224
Trophies, specimens, etc.....	Number.....	299	34, 345	421	12, 691
Wood, timber, and lumber.....	M feet.....	6, 242	220, 774	1, 838	68, 400
All other articles.....			88, 327		130, 168
Total value of products of Alaska.....			49, 244, 757		65, 505, 470
Products of United States returned.....			1, 821, 165		1, 949, 863
Total value of foreign products.....			258, 028		131, 874
Total value of shipments of merchandise.....					
Domestic gold.....			51, 323, 950		67, 587, 207
Domestic silver.....			5, 394, 107		6, 351, 204
Foreign gold and silver.....			350, 731		282, 045
			9, 180		6, 878
Grand total.....			57, 077, 968		74, 227, 334

¹ Includes fur shipped by mail and furs from Pribilof Islands.

Alaska merchandise shipped to foreign countries

Articles	Unit	1927		1928	
		Quantity	Value	Quantity	Value
Canned salmon.....	Pound.....	27,936	\$4,026	936	\$250
Salted salmon.....	do.....	20,951	3,031	4,227	633
Salted codfish.....	do.....	1,602	177	1,360	161
Salted herring.....	do.....	225	39	1,655	143
Other salted fish.....	do.....	160	24		
Fresh salmon.....	do.....	860,105	87,699	964,735	78,399
Other fresh fish.....	do.....	1,033,922	53,761	602,159	40,270
Pickled salmon.....	Barrel.....	32	809	20	500
Other pickled fish.....	do.....	10	272		
Other fish and fish products.....	Pound.....	638	61	88	21
Canned shellfish.....	do.....	772	376	1,385	494
Total fish and fish products.....			150,275		120,871
Spruce boards.....	M feet.....	2,615	59,482	2,411	56,552
Other softwood boards.....	do.....	3	94		
Other sawed lumber.....	Board feet.....	3,190	130		
Cedar logs.....				20	240
Other softwood logs.....	M feet.....	2	150	380	4,560
Other sawed lumber.....	Board feet.....			2,878	106
Piling.....	Linear feet.....	14,060	469	2,225	321
Undressed fox furs.....	Number.....	10	500		
Undressed muskrat furs.....	do.....	151	302		
Manufactured furs.....	do.....	1	125	1	110
Live animals (mink, etc.).....			3,350		2,770
Grand total.....			214,877		185,530





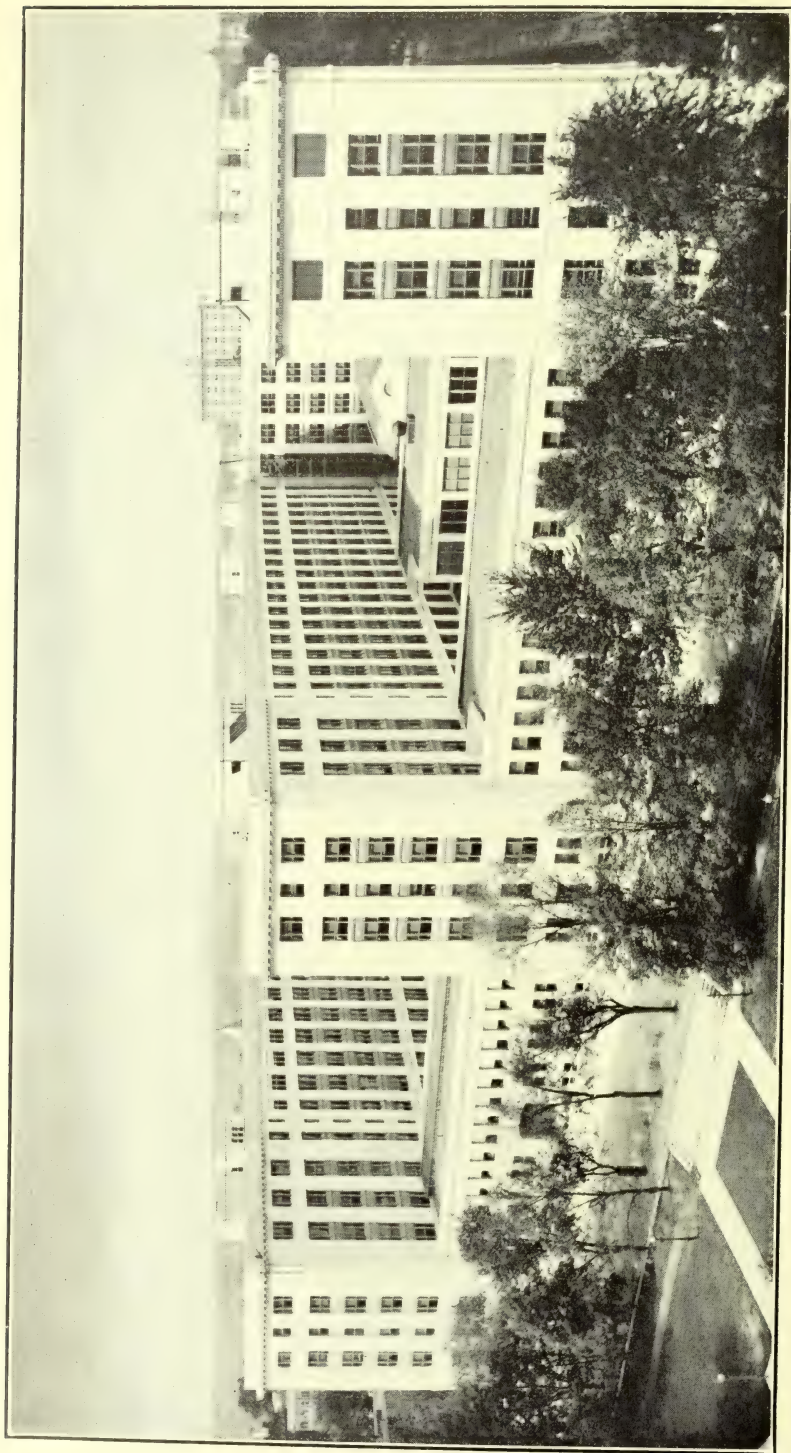


I.I.I: 1930

ANNUAL REPORT
of the SECRETARY
OF THE INTERIOR

for the FISCAL YEAR ENDED 1930
JUNE 30 ONE ONE ONE ONE ONE ONE ONE ONE ONE ONE

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INTERIOR DEPARTMENT BUILDING

ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR



FOR THE FISCAL YEAR ENDED JUNE 30

1930



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1930



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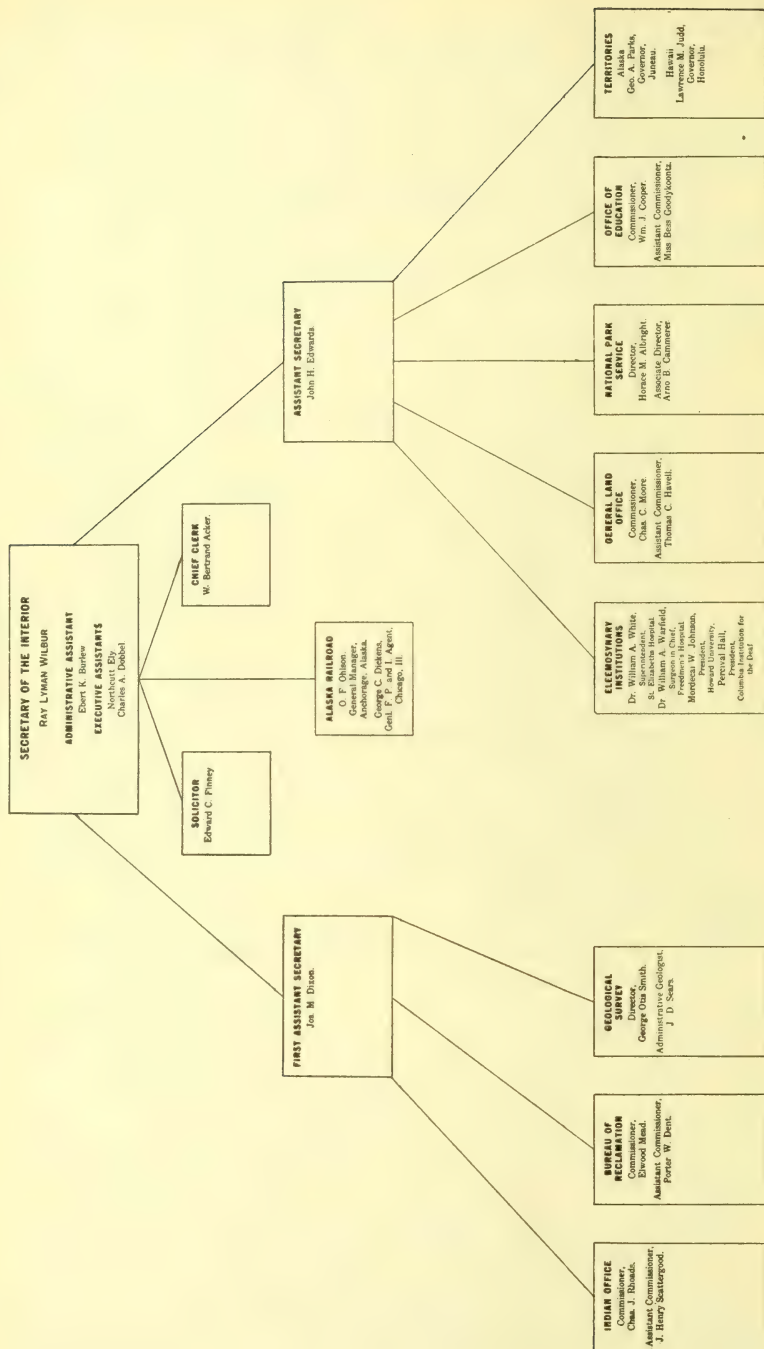
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DEPARTMENT OF THE INTERIOR



Nov. 1906

ORGANIZATION CHART

OFFICERS OF DEPARTMENT OF THE INTERIOR

Office of the Secretary:

<i>Secretary of the Interior</i>	RAY LYMAN WILBUR.
<i>First Assistant Secretary</i>	JOSEPH M. DIXON.
<i>Assistant Secretary</i>	JOHN H. EDWARDS.
<i>Administrative Assistant</i>	EBERT K. BURLEW.
<i>Executive Assistant</i>	CHAS. A. DOBBEL.
<i>Executive Assistant</i>	NORTHCUTT ELY.
<i>Assistant Administrative Officer</i>	GEORGE E. SCOTT.
<i>Chief Clerk of the Department</i>	WM. BERTRAND ACKER.

Office of the Solicitor:

<i>Solicitor</i>	EDWARD C. FINNEY.
<i>Assistant to the Solicitor</i>	ORLIN H. GRAVES.
<i>Member, Board of Appeals</i>	GEORGE B. GARDNER.
<i>Member, Board of Appeals</i>	WILLIAM B. NEWMAN.
<i>Member, Board of Appeals</i>	ALVAH W. PATTERSON.

The Bureaus:

<i>Commissioner of the General Land Office</i>	CHARLES C. MOORE.
<i>Assistant Commissioner, General Land Office</i> ..	THOMAS C. HAVELL.
<i>Commissioner of Indian Affairs</i>	CHARLES J. RHOADS.
<i>Assistant Commissioner of Indian Affairs</i>	J. HENRY SCATTERGOOD.
<i>Commissioner of Pensions</i>	Vacant.
<i>Deputy Commissioner of Pensions</i>	EDWARD W. MORGAN.
<i>Commissioner of Education</i>	WM. JOHN COOPER.
<i>Assistant Commissioner of Education</i>	MISS BESS GOODYKOONTZ.
<i>Director of the Geological Survey</i>	GEORGE OTIS SMITH.
<i>Administrative Geologist</i>	J. D. SEARS.
<i>Commissioner of Reclamation</i>	ELWOOD MEAD.
<i>Assistant Commissioner of Reclamation</i>	PORTER W. DENT.
<i>Director of the National Park Service</i>	HORACE M. ALBRIGHT.
<i>Associate Director, National Park Service</i>	ARNO B. CAMMERER.

The Territories:

<i>Governor of Hawaii</i>	LAWRENCE M. JUDD.
<i>Governor of Alaska</i>	GEORGE A. PARKS.
<i>General Manager, the Alaska Railroad</i>	OTTO F. OHLSON.

Institutions:

<i>Superintendent, St. Elizabeths Hospital</i>	DR. WILLIAM A. WHITE.
<i>Surgeon-in-chief, Freedmen's Hospital</i>	DR. WILLIAM A. WARFIELD.
<i>President, Howard University</i>	MORDECAI W. JOHNSON.
<i>President, Columbia Institution for the Deaf</i> ---	DR. PERCIVAL HALL.

FUNCTIONS OF THE DEPARTMENT OF THE INTERIOR

The United States Department of the Interior, established by the act of March 3, 1849 (9 Stat. 395), is the land, home, and education department of the Government. Its work is a permanent contribution to the educational, scientific, historical, and conservation functions of the Government. It is a fact-finding department for internal development. Its mission is largely educational and many of its activities are devoted to the discovery and dissemination of knowledge. It contributes to education through its Office of Education. It operates directly 205 schools for the American Indians and 86 for the native Alaskans. It maintains Howard University, training schools for nurses at Freedmen's and St. Elizabeths Hospitals, with a graduate school for psychiatrists at the latter, and the Columbia Institution for the Deaf. Its work in the General Land Office, Geological Survey, and the Bureau of Reclamation touches the scientific field; through the National Park Service it handles the national playgrounds of the people; and through the Pension Office it handles large financial transactions involved in the payment of pensions to veterans of the wars.

GENERAL LAND OFFICE.—Originally organized as a bureau of the Treasury Department under the act of April 25, 1812 (2 Stat. 716), and transferred to the Interior Department in 1849, the General Land Office has control of the public lands, including their survey, handling applications for homesteads and Indian allotments, desert land and mining claims, and mineral leases. Has jurisdiction over granting railroad and other rights of way and easements on public lands and adjusting State and railroad land grants.

OFFICE OF INDIAN AFFAIRS.—Originally organized as a bureau of the War Department under the act of July 9, 1832 (4 Stat. 564), and transferred to the Interior Department in 1849. Acts as the official guardian of the Indians; promotes their health and physical welfare; directs the education of Indian children; encourages their native arts and crafts; reclaims their lands and develops the natural resources in timber and minerals; supervises their funds; adjusts heirship matters and handles all Indian affairs of the Government.

BUREAU OF PENSIONS.—Originally organized as a bureau of the War Department under the act of March 2, 1833 (4 Stat. 622) and made a part of the Interior Department in 1849. Handles the pension claims and pays pensions for all the wars of the United States except the World War. Administers the civil service retirement act, handling and paying annuities to retired employees of the Government.¹

OFFICE OF EDUCATION.—Established as a department under the act of March 2, 1867 (14 Stat. 434), and became a bureau of the Interior Department in 1869 (15 Stat. 106). Furthers education by the compilation and dissemination of data covering education in the United States and foreign countries; conducts university, college, and school surveys, including experiments in education; operates Government schools for the natives of Alaska.

¹ Transferred to the veterans administration by Executive order of July 21, 1930, issued under the act entitled "An act to authorize the President to consolidate and coordinate Government activities affecting veterans, approved July 3, 1930."

GEOLOGICAL SURVEY.—Established under the act of March 3, 1879 (20 Stat. 394). Makes topographic and geological maps of the United States and Alaska; studies the surface and underground water resources; prepares and distributes reports on gold, silver, petroleum, and other mineral deposits; and, through a conservation branch, classifies public lands and supervises engineering phases of mineral leasing.

BUREAU OF RECLAMATION.—Established under the act of June 17, 1902 (32 Stat. 388), for the purpose of developing agricultural possibilities of the arid and semiarid regions of the United States. This bureau constructs and operates irrigation works; collects annual payments from water users for cost of irrigation; promotes knowledge of irrigation methods, suitability of crops, availability of markets, and improvement of farm homes.

NATIONAL PARK SERVICE.—Established by the act of August 25, 1916 (39 Stat. 535), this bureau conserves the natural beauties and unique characteristics of the national parks and monuments under its control and promotes their use for the health and recreation of the people. It also protects and restores ruins of ancient civilization and the flora and fauna of the parks.

ALASKA RAILROAD.—Construction authorized by Congress under the act of March 12, 1914 (38 Stat. 305), and completed in 1923 at a cost of \$60,000,000. This Government owned and operated road extends for a distance of 467 miles into the interior of Alaska, transporting passengers, freight, express, and mail.

St. ELIZABETHS HOSPITAL.—Established under the act of March 3, 1855 (10 Stat. 682), this is a class A institution for the treatment of mental diseases of the Army, Navy, and District of Columbia.

FREEDMEN'S HOSPITAL.—Established under the control of the War Department by act of March 3, 1871 (16 Stat. 506), and transferred to Interior Department by act of June 23, 1874 (18 Stat. 223). This hospital provides medical and surgical treatment for the colored race, its patients including indigent residents of the District of Columbia, residents of the several States, emergency cases, and regular pay patients.

HOWARD UNIVERSITY.—Established by the act of March 2, 1867 (14 Stat. 438), this is an institution of higher education of the colored youth of the Nation in liberal arts and sciences, medicine, law, and religion.²

COLUMBIA INSTITUTION FOR THE DEAF.—Established under the act of February 16, 1857 (11 Stat. 161). This institution cares for deaf-mutes of the States and Territories and the District of Columbia. It reports annually to the Secretary of the Interior and certain of its beneficiaries are admitted to the institution under that officer.

TERRITORIES.—Alaska and Hawaii are directly represented by the Secretary of the Interior in the official family of the President, many of various Federal activities in these Territories being under his supervision.

² Amended by the act of Dec. 13, 1928 (45 Stat. 1029), so as to authorize appropriations by Congress and providing for the institution being opened to inspection by the Bureau of Education.

SERVICE OF SECRETARIES OF THE INTERIOR

Name	When appointed	Whence appointed	President	Length of service
				<i>Yrs. mos. days</i>
1. Thomas Ewing.....	Mar. 8, 1849	Ohio.....	Taylor and Fillmore.....	1 5 8
2. Thomas M. T. McKennan.....	Aug. 15, 1850	Pennsylvania.....	Fillmore.....	-- -- 27
3. Alexander H. H. Stuart.....	Sept. 12, 1850	Virginia.....	do.....	2 5 25
4. Robert McClelland.....	Mar. 7, 1853	Michigan.....	Pierce.....	4 0 0
5. Jacob Thompson.....	Mar. 6, 1857	Mississippi.....	Buchanan.....	4 0 0
6. Caleb B. Smith.....	Mar. 5, 1861	Indiana.....	Lincoln.....	1 10 4
7. John P. Usher.....	Jan. 8, 1863	do.....	Lincoln and Johnson.....	2 4 7
8. James Harlan.....	May 15, 1865	Iowa.....	Johnson.....	1 2 12
9. Orville H. Browning.....	July 27, 1866	Illinois.....	do.....	2 7 10
10. Jacob B. Cox.....	Mar. 5, 1869	Ohio.....	Grant.....	1 7 27
11. Columbus Delano.....	Nov. 1, 1870	do.....	do.....	4 11 19
12. Zachariah Chandler.....	Oct. 19, 1875	Michigan.....	do.....	1 4 25
13. Carl Schurz.....	Mar. 12, 1877	Missouri.....	Hayes.....	3 11 24
14. Samuel J. Kirkwood.....	Mar. 5, 1881	Iowa.....	Garfield and Arthur.....	1 1 2
15. Henry M. Teller.....	Apr. 17, 1882	Colorado.....	Arthur.....	2 11 0
16. Lucius Q. C. Lamar.....	Mar. 6, 1885	Mississippi.....	Cleveland.....	2 10 10
17. William F. Vilas.....	Jan. 16, 1888	Wisconsin.....	do.....	1 1 22
18. John W. Noble.....	Mar. 6, 1889	Missouri.....	Harrison.....	4 0 0
19. Hoke Smith.....	Mar. 6, 1893	Georgia.....	Cleveland.....	3 5 25
20. David R. Francis.....	Sept. 1, 1896	Missouri.....	do.....	-- 6 5
21. Cornelius N. Bliss.....	Mar. 5, 1897	New York.....	McKinley.....	1 11 15
22. Ethan Allen Hitchcock.....	Dec. 21, 1898 ¹	Missouri.....	McKinley and Roosevelt.....	8 0 13
23. James R. Garfield.....	Jan. 15, 1907 ²	Ohio.....	Roosevelt.....	2 0 0
24. Richard A. Ballinger.....	Mar. 5, 1909	Washington.....	Taft.....	2 0 5
25. Walter L. Fisher.....	Mar. 7, 1911	Illinois.....	do.....	1 11 26
26. Franklin K. Lane.....	Mar. 6, 1913	California.....	Wilson.....	6 11 26
27. John Barton Payne.....	Feb. 28, 1920 ⁴	Illinois.....	do.....	-- 11 20
28. Albert B. Fall.....	Mar. 5, 1921 ⁵	New Mexico.....	Harding.....	2 -- --
29. Hubert Work.....	Mar. 5, 1923 ⁶	Colorado.....	Harding and Coolidge.....	5 4 19
30. Roy O. West.....	July 20, 1928	Illinois.....	Coolidge.....	-- 7 10
31. Ray Lyman Wilbur.....	Mar. 5, 1929	California.....	Hoover.....	-- -- --

¹ Entered on duty Feb. 20, 1899.

² Entered on duty Mar. 5, 1907.

³ The last day of Mr. Lane's service was Feb. 29, 1920.

⁴ Entered on duty Mar. 15, 1920.

⁵ Mr. Fall resigned, effective Mar. 4, 1923.

⁶ Doctor Work resigned, effective July 24, 1928.

LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington, November 20, 1930.

SIR: I have the honor to transmit my annual report for the Interior Department for the fiscal year ending June 30, 1930.

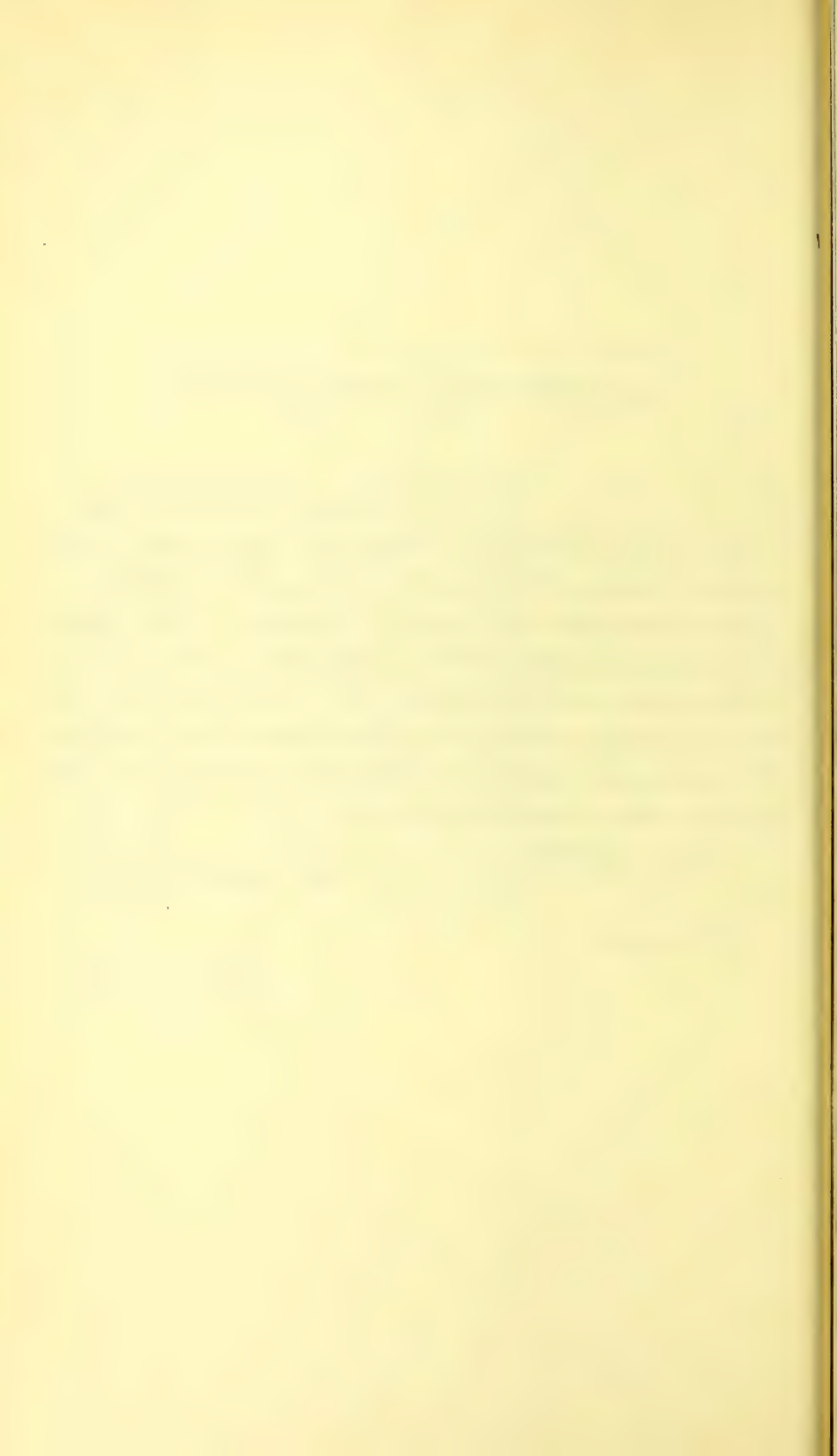
It is divided into three parts: I, Foreword; II, The Current Year's Operations; III, The Past Year's Work in Brief.

Conservation is this department's chief task, and the work of its bureaus during the past year has had that purpose as its foundation. The section on the current year's operations will indicate the part now being taken by each unit in that task.

Very respectfully,

RAY LYMAN WILBUR,
Secretary.

The PRESIDENT.



*REPORT OF THE SECRETARY
OF THE INTERIOR, 1930*

PART I: FOREWORD

CONTINENTAL CONSERVATION

Continental conservation is the key to the future of this Nation and is the present problem of this department; nearly all of its functions center about it.

In the beginning our people huddled together in certain chosen areas and developed a simple but satisfactory rural life. With the increase in numbers that followed a high birth rate and continual immigration, they gradually extended their range. The successive waves of settlers that went down our rivers, over our plains and mountains and eventually along our railroads, carried with them little but their courage and experience. In general, the conquest of our share of this continent has been of an amateurish character. This was inevitable; the job of living was such an intense one that each man had to concentrate upon it in order to make a success. If we had had full information as to the natural advantages of each new area, if he had known and understood the analysis of soils, if we had had our present quality of seeds and animal stock, a much more satisfactory result could have been accomplished. Primarily, the aim of our people was to spread over the continent a blanket of farms, each maintaining a family. If we had been able to plan in advance for the wisest location of our people upon this continent, we could have spared the great forests which were cut down in the Atlantic and some of the Great Lakes States, and have hurried our people through to the Great Plains. The contest between the new land and the old has been a constant factor in American agricultural and economic life and is still going on in various phases in our own country as well as in others. In the taking over of new land, its first values were harvested as promptly as possible, and then it was for the most part driven to the maximum of production for a considerable period.

Gradually we have been acquiring new conceptions of continental conservation. Conservation is a term around which much confusion has reigned. Conservation means wise use. Wise use means that a natural asset shall be used for the proper purpose and at the

right time. Conservation does not mean the hoarding of natural resources for a hazy, indefinite future. It does, though, mean intelligent and thoughtful planning for every resource of our continent.

The usual action of the Federal Government has been to distribute land resources into private hands as fairly and rapidly as possible. Certain artificial conceptions such as that of the acre have been used in dividing up our continent just as we have divided up our cities into town lots of arbitrary size and shape. This has been done largely regardless of the quality of the soil, amount of vegetation, the water supply, the climate, or those other factors upon which all of the values of the soil, in so far as the habitation of human beings is concerned depend. The result of this has been that there has been a large marginal failure in almost every zone throughout the country. In the best areas of the Middle West this process has not been so evident, but throughout the Rocky Mountain region and the Western States the tragic skeletons of abandoned homes tell the story of a sad process of failure that could have been avoided if we had understood the problem of spreading a great population over a continent for successful living. In this process we have recklessly harvested such readily available resources as the forests. We have thought only of their evident use and have failed to see their significance in protecting watersheds and their profound relationship to life in the valleys. Only recently as a people have we sensed the value of our river systems and our water supplies in general.

The growing sense of continental conservation is working changes.

Some years ago it became evident that our loss in trees would seriously handicap us for lumber. The great national forest system was wisely set aside to be retained as an asset of the people, rather than to have distribution into private hands.

Hidden beneath the surface of our land were great stores of coal, oil, natural gas, and minerals of many varieties stored there through the ages. Fortunately, immense stores were so distant from the market, or so hard to master, that they were left intact, although they were subject to location as mineral claims. Until the mineral leasing act was passed, discovery of these resources led to their transfer to private hands. These mineral resources, while extensive, can never be replaced. Anything that is irreplaceable should be conserved and protected for its fullest use. Certainly for the control

of these great resources some form of national strategy is desirable and many factors are now operating to bring about a better control, and one freer from waste, in their development.

A realization of the natural wonders of our country has led to a comparatively new conception as to certain parts of our continent. Their beauty has outweighed any evident utility which they seem to possess. The value of beauty in our environment did not seem to weigh heavily with the pioneer who was fighting nature in order to carve out a living for himself and family. But now, with general assent, we have some 20 national beauty spots scattered throughout all parts of the United States, each one distinctive and possessing its own charm, each one to be retained in perpetuity for the enrichment of the life of the Nation.

Looking back from this newer viewpoint we see that our conquest of the continent has been accompanied by many failures, and we now often have desolation and shabbiness instead of the natural conditions built up through centuries of time. As we look forward we begin to see the outlines of a future policy which will bring about a more intelligent use of our natural resources and which will restore some of the values we have lost. Slowly but gradually we are using each part of the continent in the way that is most profitable. This will be a long and slow process, but mistakes are costly and nature is unrelenting in carrying out her own program. Our greatest difficulties in getting the best out of our continent in the future will come from our own actions, from the artificial decisions that we have made or will make regardless of natural conditions. There are many misfits between our political units and our geography. There is a great maze of legislation built upon so-called property and human rights which must gradually be adjusted to the necessary changes associated with an increase in population and a rising standard of living. Our accommodations to a continent will inevitably take place. If we can see what they should be, we can advance faster. Science has placed a whole series of new tools in the hands of man in dealing with all of these questions. Engineering has permitted us to control nature in many ways; organization has given us the chance to unite our financial and other resources in the applications of science and engineering to the problems of life. By the use of the trained human mind, the trained human hand, and the

machine, which is the product of both, we have brought in a whole series of new opportunities for the mind and body of man.

If we had proceeded too long without thought and without mobility, we would have found many of our people trying to live upon an ash heap. We are still in danger from soil erosion and other natural processes unless we can conserve for our future certain basic and fundamental elements of our surroundings. Primarily, our whole safety as living units depends upon the plant life about us. Controlled plant life has given us our agriculture. In many parts of the country control of plant life depends on controlled water. The plant life of the past has given us our irreplaceable resources in coal, oil, and gas. These plants working away in the presence of sunshine and water to make food for themselves and for us and our domestic herds are our most valuable material possession. These plants depend entirely upon the rains, the soil, and the sun. Conservation, control, and management of plant life will determine the future of the people of America upon this great continent of ours. Thoughtful conservation and distribution of plants in accordance with our needs and the places where they can produce the most is the fundamental requirement of continental conservation. We can exhaust our stored mineral resources and still survive, but we can not destroy our plant life and succeed.

In many parts of the West our population has reached the water line. Only through more water in given localities is our normal increase in the population possible. It is, then, the control of water which is fundamental to all of our States, and to all of our citizens, and particularly to our Western States and western citizens. We are just beginning to realize that there is a connection between plant life and water supply; that the presence or absence of trees and plants on mountain and hillsides has something to do with floods and droughts; that overgrazing in one State may mean floods and droughts in another State. Throughout the ages nature has developed a certain balance and harmony in these relations. In our pioneering we have destroyed that by cutting forests, by varying the normal life of the plain and mountainside, by causing forest fires, and by committing a whole series of acts detrimental to that balance. Try as hard as we may to operate political units, to determine the functions of States in the United States, or to distinguish between the activities of various branches of the National Govern-

ment, we will only be fooling ourselves if we forget that nature knows nothing of our activities but goes on in its timeless way obeying its own laws. If we can act in harmony with those laws, if we can work in organized groups with our resources, we can succeed since our scientists and our engineers have pointed out the way.

The adjustment of a people to its environment can take place through a thoughtless struggle in the survival of the fittest, or it can be a planned, quiet, and orderly process of human organization. We have reached the point here in America where all of these forces working toward betterment must be coordinated.

We are now engaged in this country in making a survey of our childhood. The White House Conference on Child Health and Protection, is in progress as this report is transmitted, bringing together the results of the studies of 1,100 experts in this field. They are to present to us the most modern conceptions of education, of health, of recreation, and of child welfare. From these findings we should be able to get some new points of view and develop some new plans for the future of our American children. Our children are to have their home on this continent. Their lives are to be spent in the surroundings we leave for them. It is time for us boldly, thoroughly, and thoughtfully to guide the future management of our natural environment. Our spaces are broad, our range is great. We are but started on our way. We must study our, and their, estate and conserve its manifold values.

We can be secure upon this great continent if we can conserve its values through intelligent action. The prime aim for us as human beings in the conservation of the continent is to care, protect, and plan wisely for those who will inherit it. The day of the amateur in the conservation and preservation of our continent and our child life is past.

Historically the Department of the Interior has played a large part in this country's pioneering. As new territory was absorbed, the lands belonging to the National Government were distributed through the General Land Office of the department to States and to private citizens, through cession, sale, through special acts of Congress, including the homestead law, the timber and stone act, the stock-raising homestead act, and in a number of other ways.

When the special semiarid conditions of the West were met, the Reclamation Service of the department was brought into being in

order that there might be concerted action to conquer the mountain and the desert. Alongside of the problem of handling the public lands was the necessity of caring for the interests of the Indians, who had once roamed throughout the whole of our territory—thus came about the Office of Indian Affairs. In the western march, certain unique and beautiful areas were discovered. Their treasures belonged to the whole people, so that they were set apart as national parks. The lure of gold brought men to face hardships and dangers and to seek for wealth in every nook and cranny of the West. The Geological Survey helped not only to discover these mineral resources, but also all of the other forms of wealth hidden in our continent or to be developed through the control of stream flow. The discovery of coal beds and petroleum have had much to do with the development of our vast wealth.

The American public school, represented in the department through the Office of Education, has been carried along by each group of settlers until it is found almost everywhere.

In the continental conservation which is the task of the new pioneering, this department must do its share.

PART II: CURRENT OPERATIONS

Personnel.

The States and the public domain.

Oil and gas; oil shale.

Federal Oil Conservation Board.

The Geological Survey.

The General Land Office.

Reclamation

Indians.

Education.

National parks.

Pensions.

Alaska.

Hawaii.

The deaf—Columbia Institution.

Negro welfare—Howard University, Freedmen's Hospital.

St. Elizabeths.

PERSONNEL

This year saw the loss of Col. Earl D. Church, Commissioner of Pensions, by death. Colonel Church had brought into the Bureau of Pensions an administrative experience in insurance matters which, coupled with his ability and energy, worked changes and improvements that years of ordinary progress had not effected. He was especially valuable in the reorganization of the Veterans' Administration, and had he lived would have had an important part in his bureau's new affiliation.

Stephen T. Mather, former head of the National Park Service, its founder and its loyal friend, died. Though no longer part of the administrative organization, his death was a loss to the Park Service.

The Park Service lost another able officer in W. B. Lewis, assistant director, whose rare spirit and devotion to duty while superintendent of Yosemite and later in Washington were outstanding.

Changes in the department staff included the addition of Miss Bess Goodykoontz as Assistant Commissioner of Education, Dr. Harold C. Bryant, as Assistant Director of the National Park Service, in charge of education and research, Dr. W. Carson Ryan, as officer in charge of Indian education, and Charles A. Dobbel as executive assistant to the Secretary of the Interior. Otherwise the department's executive staff remains as reported a year ago.

THE STATES AND THE PUBLIC DOMAIN

In their conquest of the desert our pioneer people have erected sovereignties which must cooperate in the new pioneering. That new pioneering must be done by regions, just as 30 years ago it

was done by communities, and, in the decades before that, by individuals. Interstate agreements will help to solve these problems, and the compacts affecting the Rio Grande, the Colorado, the Columbia, and other western streams, must be the Magna Charta of this new pioneering. If one State can block the destiny of a region and a watershed by failure to think in terms of the larger regional units, a great part of the West's future control of its water will be relinquished. The future of the semiarid regions of the West is no greater than its ability to control its water. The background of community cooperation which made possible the development of the great irrigation projects in these States will eventually lead to interstate cooperation in the solution of these problems.

In considering the relations of the Federal Government and the Western States to the public domain, it is probably not generally understood that the States and the reclamation fund receive the major portion of all proceeds taken in by the Federal Government from public lands, whereas the Federal Government bears the cost of administration. Thus, last year, out of \$6,800,000 taken in by the General Land Office from all sources, \$3,167,000 was distributed to the reclamation fund, \$2,400,000 to the public-land States, \$275,000 to Indian tribes, leaving only \$954,000 in the Federal Treasury. Yet the cost of administration of the public domain amounted to \$2,222,000. In other words, \$5,567,000 of benefit was passed over to the States and reclamation fund at an out-of-pocket cost to the United States of \$1,300,000 (that figure representing the difference between the Federal residue and the actual cost of administration). Had the States and the reclamation fund borne the cost of the administration of the public domain they would have received little over half their actual receipts for the past year. The future of the minerals of the public domain is being considered by the Public Land Commission along with the question of the disposition of its surface. There are two divergent schools of opinion as to the proper use of these minerals. One is the old theory of exploitation; the other is the policy of conservation, meaning by that term wise use rather than hoarding. The latter has been the policy followed by this administration. In the face of overproduction of oil with

its resulting economic and physical waste the Government has withheld prospecting permits which might lead to an increase in this undesired production. That policy has naturally encountered opposition from the exponents of the other school of thought, more interested in immediate revenues than in the ultimate utility of oil and gas. Because State governments are to a major extent beneficiaries of these royalties there has been necessary a 3-cornered balancing of interests between the public of the United States, the oil-bearing Western States, and their citizens. The surface of the public domain cries for immediate care and the States may be more competent to give it than the Federal Government; the minerals, particularly oil and gas, on the other hand, have a greater future utility than a present one.

OIL AND GAS

The department last year asked and received from Congress two major pieces of legislation which will be important aids to this year's conservation efforts. Authority was granted for Government participation in unit operation and development of single oil pools involving public lands, permitting development of these common pools by the minimum number of wells, with a minimum waste of gas and oil and eliminating "offsetting" with its accompanying overproduction, and authorizing extensions of leases for the life of the agreement. The authority conferred by this legislation will expire January 31, 1931. Negotiations are now under way for a unit agreement in Kettleman Hills, Calif., whose production of high-grade oil, if allowed to flow under the ordinary old-fashioned wasteful conditions from a score of ready and waiting wells, would flood the oil market with gasoline exceeding in quantity the entire California production. The gas wasted from that field each day exceeds 450,000,000 cubic feet, although only 6 out of about 30 wells are being allowed to produce. Each year the waste of energy from Kettleman Hills is over twice the total expected annual electrical output of Hoover Dam. Californians who for years have urged the development of the Colorado River as a great new source of energy probably do not realize that failure to enforce strict conservation measures is costing them annually twice as much irreplaceable energy as Hoover Dam will be able to make good.

The second important piece of legislation authorized the extension of prospecting permits, in the Secretary's discretion and on conditions which he may impose. This has made possible the insertion in most of the extensions of prospecting permits a requirement that no drilling or production shall be effected until permitted or required by the Secretary.

When the President's oil conservation policy was put into effect on March 12, 1929, there were approximately 17,500 outstanding prospecting permits. On July 1, 1930, the number outstanding had been reduced to 5,094. Yet, during that time permits had been granted and permits extended wherever equities demanded it, and in no case had any permit been canceled where there had been compliance with the requirements of the law. Nevertheless, over 12,000 permits were found delinquent and canceled. The conservation policy has resulted in blowing a great deal of speculative paper off the public domain.

But there has been no real injury to the oil industry thereby in any of the seven oil-producing public-land States. Each year during the last three years more wells have been shut in because of lack of market than have been brought into production. On July 1, 1930, there were shut in, in these seven States, 6,190 wells, including 599 on the public domain; whereas new wells brought into production during all of 1929 and the first six months of 1930 numbered only 1,898, including 282 on public land. In other words, over three times as many wells were shut in on July 1 as had been brought into production during the preceding 18 months. If wells were being shut in more rapidly than new wells were being produced it is not apparent that further prospecting would result in anything but an economic waste of any oil which might be produced. And in every State except Idaho the number of shut-in wells on July 1, 1930, was greater than the number shut in on the day when the conservation policy became effective. It would be unfair, however, to make the inference from these figures too sweeping in view of the very large factor played by the single State of California, which is responsible for 5,431 of the shut-in wells and 1,562 of the new ones. But even if California is eliminated from the list the number of wells shut in exceeds the new wells brought into production during the period mentioned.

OIL SHALE

Oil-shale lands, though having no immediate value for oil, have received vigorous protection. During the past year, commencing last spring, every mining engineer in the General Land Office, save three, was called off other work and under my personal orders assisted in identifying, examining, and physically posting more than 6,400 oil-shale claims with notice of default to the United States for failure of the claimant to perform assessment work. This followed the Supreme Court decision of *Wilbur v. Krushnic*, which, although it reversed the department and sustained the claimants on the issue of assessment work, and so swept aside the bulk of our defensive procedure, left the possibility (though no certainty) that if the remaining claims were posted before resumption of work on the claim, a different result would follow. This posting work will continue during the current year, and the tremendous task of adjudicating these claims will get under way. A second test case in the courts may be expected. No leases have been issued under this administration. But oil-shale claims valid in 1920 can be taken to patent under the mining law, without any discretionary power in this department to decline to issue the patent. Accordingly about 42,000 acres have been patented.

FEDERAL OIL CONSERVATION BOARD

Recognizing that the industrial life of the Nation and our national defense rests largely upon petroleum in some form, the Federal Oil Conservation Board is continuing its efforts in the interest of practical conservation measures. Government agencies and industrial leaders, cooperating with this board, are effectively dealing with production problems in the major oil-producing States. In California, Oklahoma, and Texas efforts were made during the past year to confine crude production to actual needs, while a part of the refining branch of the industry, at the suggestion of this board, operated on a 6-day instead of a 7-day basis so that output might more equitably meet requirements. On May 30, 1930, the board rendered a fourth comprehensive report to the President, surveying national petroleum conditions and advancing certain specific observations. A volunteer committee on petroleum economics, consisting of State officials and industry leaders, made two special reports to this board dealing with supply and demand factors, possible

allocation of crude requirements, and imports and exports of crude. The basic efforts of the Federal Oil Conservation Board are to prevent waste in the producing and handling of our natural petroleum deposits. As chairman of the board, the Secretary of the Interior is effecting practical conservation measures in connection with the development and maintenance of the public domain and Indian lands.

THE GEOLOGICAL SURVEY

In looking forward to the fifty-second year of continuous public service of the Geological Survey, Director Smith states tersely: "The one-hundredth report of the Director of the United States Geological Survey may be expected to be simply a report of progress." For, as he says, "the work of scientific investigation is a continuing work, and its field always expands, never contracts."

As agricultural, industrial, and mining development go into more and more intensive phases, the highly specialized service of the Geological Survey will adapt itself to increasing service. Last year more than \$4,000,000 was spent, and represented as sound an investment in the industrial development of this country as the Federal Government could make. The fiscal year 1930 shows increases of 10 per cent in total expenditures, nearly 20 per cent in new maps, and nearly 30 per cent in book publications. Personnel (80 per cent engineers and scientists) was larger than at any other time, even when the Bureau of Mines was a branch of the Geological Survey, and this year's appropriations exceeded by 50 per cent those of 1910, the last year before separation of the Bureau of Mines. This 20-year period has seen a notable growth in both of these fine services, although postwar economies have not permitted their growth to keep pace with that of the industries which they serve. "Pure research of to-day is applied science of to-morrow," and these Government engineers, facing the Nation's increasing demands for raw materials and growing needs of basic engineering information, perform an essential service. The Geological Survey has the special function of maintaining the flow of raw materials to industries. The need for that function is greater to-day than it was 50 years ago, and 50 years in the future it will be more imperative than it is now. The Geological Survey faces an indefinite period of increased growth.

A major contribution of the Geological Survey has been the conservation of the Nation's natural resources through its supervision of administration of the mineral leasing act. The past year has seen a dramatic example in the harnessing of Kettleman Hills.

Accurate stream measurement is another great function of the Geological Survey. It is the basis for our control of water, and in control of water lies this country's future.

The topographic map of the United States is less than half completed. There is urgent need that it be completed as rapidly as possible. Such maps have a permanent utility.

The Geological Survey as a fact-finding agency faces a growing demand for facts regarding the country's natural resources, and it must grow with the demand.

THE GENERAL LAND OFFICE

The General Land Office has had an integral part in the building of the West. The public-land States owe their very existence to the national public-land policy and must depend on the basic surveys for expansion and development. Our country was settled by the land-hungry; boundaries and ownership of land must be determined with scientific accuracy and legal finality before development may commence. The work of the General Land Office is not local but affects the citizens of every State in the Union. Eastern investors have placed their capital in the mining and agricultural developments of the West. Delays in adjudicating cases bring protests from every section of the country.

Increasing responsibilities.

The responsibilities of the General Land Office have not diminished but have multiplied with the shrinkage of the remaining public domain. Its very depletion has made it more valuable in the eyes of the public and increased the competition for the residue. Adjudication of the resulting contests has meant an increasing burden of work. Furthermore, contrary to the general impression, there has been a sharp increase in actual acreage of entries during the last two years, due largely to the stock raising homestead act of 1926. There has been a rise from about 3,700,000 acres entered in 1928 to about 5,500,000 in 1930, whereas the funds provided for handling this work have shown a steady drop from \$3,300,000 in

1925 to less than \$2,225,000 for 1930-31. In other words, there have been more entries, requiring greater clerical work because of contests and legislative refinements, which must be disposed of with diminishing funds. In 1910 a clerk could approve for patent 125 homestead cases each week. To-day, under the changed conditions outlined above, the figure is 60. Delay and public inconvenience is the inevitable result. On a chart showing the status of the cases pending for field examination on the first day of each fiscal year from 1922 to 1931, with the new cases listed for field examination during the year, and the cases closed, it will be noted, significantly, that the curve representing "final action" closely parallels the line indicating the funds provided and, roughly, the line indicating the average number of field examiners.

The remaining unappropriated and unreserved public domain is, exclusive of Alaska, about 180,000,000 acres.

Need of funds and personnel.

The less pretentious public lands are as essential to watershed strategy as the more valuable lands in private hands. The sums expended for the protection of the public domain are entirely out of line with the importance of the work. This protective work, the responsibility of the field service of the General Land Office, has furthermore been seriously crippled during the past year by withdrawal of all except three of the mining engineers for work on oil shale lands to facilitate the repossessioning of defaulted claims, under the Secretary's instructions given last spring. Similarly, field examination of the merits of asserted mining locations in the Hoover Dam area has imposed an added burden, requiring actual tests on the ground to indicate value or lack of value of the claims. These extraordinary demands on the field service are typical of the burdens assumed by the other branches of the Land Office in connection with special legislation, preparation of reports needed in litigation, preparation of material for Congress, etc. There have been no additions to the legal force of the Land Office for five years and many of their experienced law officers are nearing the retirement age. If the Land Office is to discharge satisfactorily its great function, new blood and new money must be brought to its aid. If the public domain is transferred to the States the work of the Land Office must be accelerated for several years in order to pass over to the States suffi-

ciently completed records and surveys to enable them to carry on the old functions of the Land Office with new personnel.

Particular activities.

Every line of activity in the Land Office has increased during the past year. The original entries rose over 16 per cent, to 5,434,000 acres. Unperfected entries rose to 22,550,000. Fire-protection appropriations were inadequate. Only \$40,000 was available, whereas \$47,000 was spent. Even then it was impossible to maintain any lookouts during the hazardous months of May and June. Coal fires have been burning for years in Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming. This loss to the Nation must be stopped and funds are needed to do it.

With all these handicaps the Land Office has succeeded admirably in discharging its difficult and highly technical work and its esprit d'corps and devotion to public service is not surpassed anywhere in the Government.

Certain features of the Land Office work during the past year deserve emphasis. The oil and gas conservation policy resulted in the cancellation of 8,358 prospecting permits; 4,474 permittees were called upon to show cause why their permits should not be canceled; 150 formerly canceled permits were reinstated; 199 new permits granted on a showing of equities; and 133 applications for prospecting permits were reinstated.

An unfortunate situation exists as to the revested Oregon-California Railroad and Coos Bay Wagon Road land grants in Oregon. Under the law payments in lieu of taxes are made to the 18 counties involved by the United States on this revested land. These payments have consistently exceeded the receipts from the sale of timber, and the prospect of their timber improving in price is dubious.

It is interesting to note the ratio of favorable action to unfavorable action recommended by the field service. Sixteen thousand eight hundred and sixty cases were examined, in which 5,226 received adverse reports and 11,634 favorable.

The public-land surveys were extended in 22 States and Alaska. On a linear basis, 15,911 miles of surveys cost \$25.04 per mile.

These figures give some approximation of the magnitude of the task of the Land Office, and its necessity for adequate nourishment.

RECLAMATION

Shall reclamation be continued?

From time to time there has been agitation of the fundamental question of whether or not the Federal Government should continue in the reclamation of arid lands. Objections have been founded chiefly on misconceptions of the supposed competition between these new lands and the older farming regions which are already burdened with overproduction. Actually only about seven-tenths of 1 per cent of the Nation's cultivated area is included in reclamation projects. The most important crops produced on reclamation projects are, in the main, of such a character and come into production at such a time that there is no substantial competition with eastern producing States. Reclamation is an investment in national wealth from which the Nation derives large returns. Last year the crops produced were worth over \$160,000,000, or, roughly, the entire construction cost of all reclamation projects, exclusive of the cost of their operation and maintenance. The cumulative value of crops grown on Federal reclamation projects exceeds \$1,600,000,000. Reclamation's 40,000 farms have a population of nearly 160,000 and, in addition, support 214 project cities and towns, with an additional population of over 470,000. About \$250,000,000, including operation and maintenance charges, has been expended by the Federal Government for reclamation projects which has increased the value of the land and other properties on farms and in towns within reclamation enterprises by at least a billion dollars, or four times all Government expenditure.

Economic considerations.

Reclamation is the backbone of the far West. The fundamental question as to whether or not it shall continue should be answered in the affirmative so long as development is carried out along sound economic lines. In early days the brilliant engineering achievements of the Reclamation Service surpassed the attention given economic considerations, which was the natural result of lower per-acre costs then obtainable. There was a feeling that the settler would in some way dig in and succeed. In some areas there has resulted delay, disappointment, and failure. In others, the lower engineering costs of those days rendered economic considerations less important than

at present. To-day the easy things have all been done. Irrigation costs ranged from \$25 to \$50 an acre in the beginning. The new projects range from \$75 to \$200. Hydroelectric power is one source of revenue to assist in meeting these costs. Contribution from benefited cities and areas protected from floods should be another source.

Commissioner's recommendations.

The handling of hydroelectric power, contribution from benefited areas, and the problem of control of the privately owned lands within the projects, together with the necessity of credit for the improvement of farms, present problems in local, State, and Federal cooperation which have resulted in a number of far-seeing recommendations from the Commissioner of Reclamation. These recommendations, which constitute the current policy of the Bureau of Reclamation, have been placed before the President's Committee on the Conservation and Development of the Public Domain along the following lines:

1. The present policy of turning over the operation of works to the water users as soon as they are able to take control should be continued.

2. In the future there must be an appraisal of the benefits which the investment of the Government and the labor of the settler bring to the community at large for the purpose of estimating proper contributions from the State and benefited cities in the financing of projects.

3. No new project should be undertaken unless there is a definite prospect of complete repayment of the Federal expenditures and unless the settlers are committed to full responsibility for their contracts; on some projects there is too great a tendency to adopt whittling tactics in an endeavor to convert the generous Federal noninterest-bearing investment into a gift.

4. There must be a revision of laws for reclaiming privately owned land. Nearly all the future projects will be mosaics of land in public and private ownership. After spending millions of dollars on reclaiming these holdings the Government has no control over the qualifications of the people who settle private land. As reclamation construction costs on the newer projects are frequently in excess of \$150 per acre, it is vital that the dry-land price of these lands be

held down to a nonspeculative basis. The assessed valuation on some projects is shown to be \$11 per acre exclusive of the Federal water right; yet speculation in advance of the assumption of the Federal repayment contracts has skyrocketed sale prices of some dry lands to \$150 per acre. The result is an inevitable loss to the Government, for the net capital cost to the settler is, in such a case, about \$140 in excess of the maximum cost upon which the bureau's finding of feasibility of the project was based.

5. As to hydroelectric development the policy expressed in recent appropriation acts should be adhered to, that is, application of power profits, first, to repay the cost of the power plant and appurtenant works; second, the cost of the reservoir and dam which regulates the delivery of water to the plant, and, after that, all net revenues should be credited to the revolving reclamation fund in the same manner that oil royalties are now credited. Existing contracts must, of course, be respected.

6. Construction expenditures each year should be restricted to the estimated increment to the reclamation fund for that year.

This increment comes from the sale of public lands, oil royalties on the public domain, from repayment of construction costs by the settlers, and from profits from hydroelectric power. These revenues, together, average between eight and nine million dollars per year. The profits from hydroelectric development which are created by a capital investment which comes out of the reclamation fund should go back into that fund as a foundation for new construction. The theory of the reclamation fund is that it should be a self-supporting cooperative venture. The revenues which go into it come largely from the States which benefit by it; but inevitably oil revenues from some States exceed the reclamation expenditures in those States, whereas in others the reverse is true. Hydroelectric profits on future developments, like oil royalties, should go into the common pot, and new construction should not exceed the increment from these sources plus construction repayments.

7. Thought should be given to the possible desirability of legislation which will permit the reclamation fund to purchase all surplus land within a project area, to prevent speculation and to preserve to the Reclamation Bureau the choice of properly equipped settlers. The same consideration, with added force, applies to land sold for

tax delinquencies, especially as repeated delinquencies raise the capital charge on the land to a point where the Federal repayment obligation can not be undertaken by a purchaser and the land remains indefinitely unproductive.

8. Attention should also be given to the problem of refinancing certain selected private projects with Government funds. Many of them, paying commercial interest rates, are in poor condition, whereas Federal funds loaned at 4 per cent would recapitalize certain of them on a self-supporting basis. Such a program must be carefully planned before the benefit of it is given to any particular project.

Major surveys.

Major surveys now being carried out in the Reclamation Bureau include the Columbia River Basin project, an undertaking greater than the Boulder Canyon project on the Colorado River. A silt area, larger than Delaware and Rhode Island, deposited by a prehistoric lake before the Columbia forced its way through the Cascades, is available for reclamation, depending on the feasibility of various suggested methods of getting water to it, all of them spectacular.

All construction to be carried on by the Bureau of Reclamation during the coming year (except Hoover Dam and some minor exceptions) will be in accord with the 10-year program initiated several years ago, unless new legislation intervenes, and all of its cost will be borne by the self-supporting reclamation fund, without burden to the Federal Treasury.

Hoover Dam.

The greatest engineering job ahead of this department is the construction of Hoover Dam in the Colorado River. The project was dedicated September 17. Construction on the railroad began that day. Work is now under way on the power line which will furnish power for construction of the dam. Contracts for the dam itself will be advertised within a few months. This structure will raise the water level 582 feet, generate 1,200,000 horsepower of electricity, cost, with its power plant, over \$100,000,000 and will pay for itself by its own falling water. The result will be flood protection to Arizona and California lands, reclamation of deserts, improvement of navigation, and the bringing of needed water for domestic supply

to the coastal plain of Southern California. Power-sale contracts were successfully negotiated which will reimburse the United States for the cost of the dam and power plant if the rates set in these contracts continue to be maintained when the readjustment periods prescribed by the law are reached. The entire financial burden is assumed by California purchasers of power, who, however, have agreed to relinquish 36 per cent of the prime power to the States of Nevada and Arizona when they desire it. The 64 per cent absorbed by California will be divided 36 per cent to the metropolitan water district, which proposes to build an aqueduct from the Colorado to the Southern California coastal plain, 13 per cent to the city of Los Angeles, 6 per cent to other municipalities, and 9 per cent to the Southern California Edison Co. (Ltd.) and associated companies. All secondary energy is allocated to the metropolitan water district, with a privilege to the city and company to use equally whatever secondary power is not in use by the district for the time being. The city, in return for its 13 per cent, and the company, in return for its 9 per cent, have underwritten the shares of the States of Nevada and Arizona, pending use of the power by those States, for a total obligation of 64 per cent. The States may demand their allocations, 18 per cent each, at any time for 50 years. Revenues which will be derived from the rate of 1.63 mills per kilowatt-hour for firm energy and one-half mill per kilowatt-hour for secondary energy will net to the Colorado River Dam fund a surplus of \$30,000,000 to \$60,000,000 for other dams on the river, during the 50-year amortization period, and will net to the States of Arizona and Nevada between \$300,000 and \$600,000 per year per State, if secondary power is available in the amounts expected.

The aim in this power allocation, as agreed upon by all of the interests who assumed a firm obligation to buy the power, was to provide as wide a regional benefit as possible at a rate which will insure the sale of the energy. Accordingly 3 States, 13 cities, the metropolitan water district, and 4 utility companies serving the great agricultural area outside the municipalities will receive this energy.

Next to the control of the Mississippi, this is the greatest attempt at solution of a whole region's water problem that the country has before it. The necessity for flood control and the thirst for water have made it necessary and possible to erect this structure in the

middle of a desert, transport its power 250 miles and sell it over an oil and gas field in order that the falling waters of the Colorado may earn the cost of their own capture. The engineering is in the hands of an organization which has built over 100 of the world's great dams without a failure. They will successfully divert the river through four great tunnels each 50 feet in diameter, together capable of carrying the Mississippi's flow at St. Louis; will build this dam, and will go on to other big jobs for this Nation, all in their stride. It will be a monument to the engineering genius of many men, headed by Dr. Elwood Mead, Raymond F. Walter, John L. Savage, Walker R. Young, and their predecessors, Arthur P. Davis and Frank E. Weymouth.

The background for present work.

The magnitude of the engineering work accomplished in reclaiming the arid lands of the West can only be conceived when a figurative comparison is used. In creating its 39,970 irrigated farms, peopled with 157,088 inhabitants, this bureau has indirectly brought about the development of 214 cities and towns, the population of which when added to the project inhabitants equals more than the entire population of the District of Columbia.

To accomplish this there has been excavation of enough material to have created a ditch across the continent with a 50-foot width and a 10-foot depth. Riprap placed by this bureau to date would create a pyramid nearly equal in size to the Cheops—the largest pyramid of Egypt. Concrete placed to date would have paved the shortest direct route from New York to Los Angeles with a 6-inch paving on a 16-foot highway. Telephone and power transmission lines used by this bureau on its various projects aggregate enough in distance to parallel the above phantom highway throughout its length with a mileage of telephone line sufficient to have created a cross line from Chicago to New Orleans.

The Bureau of Reclamation has a remarkable backing of experience for the building of Hoover Dam.

INDIANS

Common sense administration of the affairs of the Indian was not possible under old conditions, since much that should be done by administration has been done by legislation. There is a real

opportunity at the present time for some constructive legislation by Congress which would open the way to a more efficient operation of the problem of the Indian. Concrete suggestions have been laid before Congress by the Indian Service.

The old situation is unsound and will remain so until the Indian takes his place side by side with the rest of our citizenship, with the normal self-respect that goes with self-support.

The Indian boy and girl should be given an education up to the average of the white boy and girl with whom they must compete if they are to become self-supporting. In the past for the most part the schools have not gone beyond the lower grammar grades.

Our whole program should be to give the Indian child increasing opportunities and independence as rapidly as he can be trained. Until more administrative freedom, through new legislation and mobile funds, is provided, little in the way of advance can be anticipated.

Guardianship—Person versus property.

In our 100 years' dealing with the Indian two problems have been confused. One relates to his person; that is, his health, education, employment, and general welfare. The other relates to his property—individual, tribal, allotments in trust, allotments in fee, indivisible tribal property and tribal property of other characters.

The Federal theory has been one of guardianship; unfortunately, guardianship of the person and guardianship of the property have been deemed inseparable. Progress of the individual Indian toward self-support has accordingly been held back to the necessarily slow pace of a distant Government administration of his vast properties.

Objectives.

The Federal Government has drifted into a piecemeal solution of the Indian problem through adoption of the Nation's legislating machinery as the active agent. Piecemeal legislation for individual reservations has created a patchwork of laws which renders Indian administration probably the most confusing job in the Federal Government. The solution of the problem will take a generation; and it can be reached only if two landmarks are kept plainly in view: (1) The Government must be divorced more and more from supervision over the Indian's person, through the gradual break-up of

the old reservation system; (2) modern business methods and tools, such as the corporation, joint stock association, or trust, must be applied to the handling of his property.

Personal care.

The problems of person and of property are related but distinct. Some form of guardianship of the Indian's property will be necessary for a long time. But as to his person and personal development the reservation system has proved thoroughly inadequate. We have requested, and Congress has granted, funds to accelerate attention to health, education, welfare and employment, and the gradual separation of young Indians from the old reservations. But, unfortunately, the other question, relating to his property, presents legal and economic complications that only carefully planned legislation can solve.

This year's start.

As regards the Indian's personal welfare, an encouraging start has been made this year. A 30 per cent increase in appropriations, about \$5,000,000, was secured, effective, however, only since July, 1930. The new Indian Service administration had to use, its first fiscal year, the machinery and money available, and only now can embark on a program of its own planning. Better food, better clothing, new specialists in vocational education, elementary education, and field supervision; experienced agriculture-extension-work men, reorganization of the Washington work so as to enable education, agriculture, and industrial work to be major administrative divisions under experienced heads; reduction of the retirement age in the field force from 70 to 65, resulting in opportunity for recruiting new blood; setting up a personnel officer to see that promotions and personnel questions are handled on the most effective basis; these changes have been the starting points. Reorganization of the Indian Service is proceeding on sound lines with an eye to the result a generation from now, rather than immediate sensational overturns.

Education.

In the gradual processes of adaptation of the Indian to his surroundings it is interesting to note that of the approximately 72,000 Indian children in schools in the United States this year, 38,000 are attending

State public schools and the number is increasing from year to year. The Government is paying tuition for them in 861 white communities, 23 more than last year. Hundreds of other communities admit Indian children without tuition. Of the other 34,000 who go to Indian schools, 4,000 live at home and go to Government day schools. There are 12,000 in reservation boarding schools and nearly 12,000 in boarding schools away from their own reservations; 6,000 more attend mission and other private schools. In addition to the 72,000 in schools there are about 9,000 others of school age, all of whom should be given an educational opportunity. Extension of boarding schools is not being encouraged; day schools, where the children can live at home, and particularly schools where they will associate with the white children, are being furthered at every opportunity. During the current year, however, the drought and economic conditions will impose a heavy demand upon boarding-school facilities.

An educational study among the Five Civilized Tribes has been completed and will facilitate plans for increased emphasis on day-school attendance at white schools.

Solution of the problem of Indian education will receive added impetus during the coming year through the appointment of Dr. W. Carson Ryan, jr., of Swarthmore College, formerly of the Office of Education, as director of Indian education. We have also been fortunate in borrowing for one year from Cornell University Dr. Erl A. Bates, author of the Bates plan, which has been applied with success in New York State. It presents one of the soundest methods of approach to vocational education for the Indian which has been actually tried. It emphasizes education in trades, agriculture, commercial arts, home making; and a key factor of it is cooperation by the States. Indians are citizens of the States and voters. It must be made increasingly clear that there is a State as well as Federal responsibility to these citizens.

Law and order.

The need has been pointed out for legislation on law and order on Indian reservations. Jurisdictional questions between the Federal and State Governments are badly confused. The Federal Code in 1910 gave Federal courts jurisdiction over eight major crimes committed on Indian reservations. Other crimes are in an uncertain border class where many States decline jurisdiction and the Federal

courts have none. Four solutions have been considered: (1) Submission of reservations to State criminal laws to be applied in State courts; (2) a special Federal code to be applied in Federal courts; (3) State laws in Federal courts; (4) use of tribal courts on some reservations. A valuable study is now being carried on by the Board of Indian Commissioners (an independent body not associated with the Indian Service, and whose report is summarized in Part III of this report) with a view to adaptation of these differing methods to suitable classes of reservations. It is to be hoped that some uniformity in plan, though not in detail, can be secured despite the widely differing local problems.

Problems of property.

In December, 1929, there were forwarded to Congress with my approval four letters which concretely stated the Indian property problems. Those problems must be solved before we can put the Indian problem behind us. The principal ones are:

1. The individual tribal estate must be administered by some method other than the distant Washington supervision of detail which is necessary under existing law. Many tribes have such estates in oil, timber, power sites, grazing lands. The tribal organization is a primitive prototype of our corporations. The adoption of the white man's corporate system may, on careful study, prove to be a better method than the present long range guardianship. One method proposed is the creation of tribal corporations under which the Indians' interests would be represented by shares of stock. Regardless of his good or ill fortune in holding on to his interest, the physical tribal estate would remain intact, not subject to white encroachment. Under this plan, it is argued, the Indian might be swindled out of his stock, as he is frequently swindled out of his land, but the tribal forest or oil would not be wasted and dissipated in consequence of it. The corporate method should be tried gradually, developing with experience.

2. Indian claims against the United States continue to be pressed upon Congress and many of them find their way with the permission of Congress into the Court of Claims where they present a staggering burden on that court, on the Comptroller General of the United States, and on the Indian Service. Present methods of adjudication may leave some of these claims undisposed of a hundred years from

now. Meanwhile, the hope of recovery has an unhealthy effect on the tribes concerned. Some method of expediting disposition of these claims is desirable. A special Indian court or commission offers one solution.

3. Some \$35,000,000 of liens imposed upon allotted land held under the Government trust were created by statutes whose constitutionality has been questioned and this amount may eventually be a loss to the Federal Treasury. The general allotment act which created the trust allotment system provides that "the United States will convey the same (allotted land) by patent to said Indian or his heirs * * * in fee, discharged of said trust and free of all encumbrance whatsoever." Nevertheless, subsequent legislation has specifically authorized the imposition of liens on Indian trust lands for reclamation costs and other expenditures amounting in all to over \$35,000,000, despite the language of the original allotment act which has been carried over into each special allotment act and into the trust patents issued to the Indians. It is time that thought was given to a reconsideration of the original allotment act, the special allotment acts, and to an eventual disposition of this constitutional question. The higher courts have not passed upon it and the collection of the liens has proceeded in all cases where Indian allotted land burdened with a lien has been sold. The Government has been reimbursed and the reimbursement taken out of the sales price of the land. The Indian, not the purchasers of the allotment, thus pays the reimbursable lien.

4. A more urgent question is raised by the status of Indian allotted land on the death of the allottee. As a practical matter sale is nearly always necessary; the Indian heir who may desire to remain on his allotment and cultivate it is rarely able to buy out his coheirs who may desire liquidation of the heirship estate by sale. The consequences are generally unfortunate; the allotted Indians of the second generation usually become landless. As an example, on the Blackfeet Reservation in Montana one-third of the allotted area of 410,000 acres is now in the class of heirship land, nearly all of which is theoretically on the market. Some means must be provided whereby the allotted land could revert to the tribal estate on the death of the allottee, becoming thereupon subject to reallocation. Harmonizing such a plan with existing legislation presents a major

problem. Such a plan would, however, be consistent with the corporation plan mentioned above, resulting in the allocation to allottees of shares of stock, carrying the right of occupancy to the land rather than carrying the title to the land itself. Furthermore, the corporation might grant reimbursable loans to those heirs who desire to continue as cultivators, with which they could purchase the interest of heirs who preferred the money. There is no greater single burden on the administration of Indian affairs than allotted lands and particularly heirship lands. The allotment act in its entirety with the whole system of reimbursable liens needs legislative review and reconsideration.

5. Irrigation problems are complicated by the fact that under existing law this department must maintain side by side, and independently of each other, two reclamation services performing the same kind of work, under separate appropriations and with separate staffs. One is the Bureau of Reclamation, which has 24 projects. The other is the Indian irrigation service, which has about 180 small projects, 18 major ones. In 1929 the expenditures by the two were almost equal due to the construction of the Coolidge Dam in Arizona, an Indian irrigation service project. Construction of projects by the Indian Service has cost over \$36,000,000; over \$28,000,000 will be needed to complete these projects. On them, 180,000 acres are white owned, 103,000 acres owned by Indians but leased out, and 120,000 acres owned and farmed by Indians. On many of the Indian projects the great bulk of the land has passed into white ownership or white occupancy under lease. For example, on the Yakima Indian project only 7 per cent of watered land is farmed by Indians. Many of these projects were commenced on a small scale on the local initiative of the superintendent or the Indians and the legislation authorizing others specifically provided that the project should be created without cost to the Indians. Nevertheless, the act of August 1, 1914, required that all funds theretofore or thereafter expended for such works should be reimbursed. Such a reversal of former policy served to complicate the constitutional questions mentioned above. Furthermore, the Indian reclamation projects undertaken since then have been programmed on a reimburseable basis whereby the Indians' lands would eventually bear the cost of the project. If the constitutional doubt suggested above should be resolved against the Government the whole Indian irrigation structure would represent a

precarious Government investment. If the ultimate loss to the Treasury should redound to the benefit of the Indians it might be viewed with more complacency. Actually the great bulk of Indian Government lands in irrigation projects are headed gradually toward white ownership due to the death of the original allottees and sale of the unallotted lands. Most trust restrictions are mandatorily removed under the law on the death of the original allottee. The present policy of continuing an independent irrigation service for the Indians has been required by legislation, and has been based on the thought that Indian irrigation interests need special protection. It may possibly prove sound on thorough consideration; but at least a complete legislative review of this problem is required. *Prima facie* it presents an anomalous condition.

Indian water-power interests.

There is now under construction the development of the Flathead power site in Montana which will yield to an Indian tribe revenue ranging from \$60,000 per year to \$175,000 at the end of a sliding scale period, and will pay a total of \$2,845,000 over a 20-year period as rental of the site. This result is a credit to the business background and methods of the new Indian Office administration and terminates an undecisive situation of some years' standing.

Another question unsettled for several years affecting an Indian tribe in Arizona was determined by the granting of rights of way to the proposed Paradise Verde irrigation district across Government lands, in return for an undertaking to supply the Indians with needed water.

EDUCATION

Present Federal activities.

The present administration is much interested in the subject of education. The nature of the Federal Union, however, makes it constitutionally impossible for the Federal Government itself to engage in education except in such cases as training officers for its Army and for its Navy, educating the wards of the Government, such as the Indians and the natives of Alaska, and assisting through the District government in the educational program of the Capital City. Under a broad interpretation of the constitutional clause relating to general welfare, Congress has from time to time granted subsidies to encourage the States and their local subdivisions in embarking upon new programs in education. Outstanding examples of this are

the appropriations which have been made for the advance of agricultural education and technical education. On the college level these grants have led to the establishment and helped in the maintenance of the so-called colleges of agriculture and mechanic arts in the several States in the Union. Such appropriations have been administered through the Commissioner of Education in the Department of the Interior and through the Department of Agriculture.

Advisory committee on education.

The important advisory committee on education, made up of leading educators of every field, has as its function a determination of the proper relation of the Federal Government to education in this country. It is considering the proper educational activities of the Government itself, the question of subsidies by the Federal Government to colleges, and the field of subsidies for education in secondary and elementary schools. To those who feel that the time has come to crystallize the Federal relationship to education the Memorandum of Progress by the National Advisory Committee on Education, covering the field of Federal relation to education, will be illuminating; the divergence of views as to the relationship of Federal and State Governments in this field shown by this able and representative committee, and the earnest effort being made to solve these questions, indicate that this problem is far from being ready for a final crystallization. No more important study of governmental functions is going on at the present time.

Changing conditions.

Education may seem static, but it never is. In the mass, both socially and intellectually, certain cleavage areas in the educational machinery are appearing. One of them cuts through the middle of the traditional college course and is leading to the rapid spread of junior colleges, both private and public in many parts of the United States.

Impingement of masses on the colleges and the lack of clear distinction between advanced and elementary study is the chief cause for college failures. The Office of Education can play a useful part in helping the readjustment of our educational system to these new lines of cleavage.

Reorganization of the Office of Education.

The coming year will find the Office of Education functioning on a changed basis.

As reported a year ago, the name given in the organic act has been reinstated, so that the Office of Education no longer functions under the name of "bureau" with its administrative connotations. A higher classification has been secured for the commissioner, increasing the prestige and salary of his position, and the post of assistant commissioner has been created, with the classification formerly held by that of the commissioner.

The commissioner has been relieved as much as possible from administrative responsibilities. Under existing law his functions are twofold: First, in connection with research activities in the United States and, second, administrative functions in control of the Alaskan school system. In both fields the past year has seen important changes made on the commissioner's recommendation.

Changes in Alaskan work.

Formerly his Alaskan activities included four major divisions: (1) Administration of nearly 100 schools including 3 resident schools; (2) medical service among the natives, including supervision of 6 hospitals with their staffs of 30 nurses and a boat on the Yukon carrying a physician, a dentist, and 2 nurses; (3) operation of a supply steamer between Seattle and Alaskan ports, many of them not touched by commercial steamships; (4) supervision of the reindeer industry which, like every stock industry, has presented problems of upbreeding of stock, crossbreeding, scientific methods of feeding, fighting of pests, and marketing, including such purely commercial enterprises as stockyards, abbatoirs, cold-storage plants, export organization, etc.

It appeared to me to be futile to have a Washington office staff with highly trained experts in education struggling with these problems of agriculture, business, and medicine.

Two major changes were accordingly made in the Alaskan work of the Office of Education. The reindeer service was transferred to the Governor of Alaska as representative of the Secretary of the Interior. The Seattle office, which formerly performed the dual functions of a business agent and a headquarters for educational su-

pervision, was divided, and its educational functions transferred to Juneau, Alaska. The business activities were continued in Seattle but transferred from the Commissioner of Education to the Secretary of the Interior, taking over the supply steamer *Bower* formerly operated by the commissioner.

So far it has not been possible to work out a practicable method of transferring the medical responsibilities from the commissioner to other shoulders but that problem will be worked out.

This change of emphasis has made possible the concentration of the Alaskan work of the Washington office on more strictly educational lines including study of the capacity of the natives, adapting a course of study for them, and preparing teachers for the peculiar Alaskan conditions.

Research work.

This reorganization of Alaskan work has also made it possible to revitalize the other and more important branch of the Office of Education work: Research and assistance in American educational problems through the Washington office.

Office organization.

A reorganization was effected January 1 which established six major divisions. The first is the division of educational research under the direct supervision of the assistant commissioner. This division is carrying on work along five lines: Collegiate and professional education; study of American school systems; special problems; statistics; and study of foreign school systems. The other five major divisions established were: Editorial, library, service, administrative, and a division of major surveys, the last named being under the immediate direction of the commissioner.

Major surveys.

These major surveys under the commissioner are proceeding along certain general lines of policy. The policy is to place these surveys under the charge of groups of the finest available outside experts in the country, serving for this work on a part-time basis, assisted by a permanent Washington staff, and having available for consultation a representative group of laymen.

The survey of land-grant colleges has been completed and considerable progress has been made on that of secondary education.

A third major survey just undertaken will cover the field of teacher training in the United States and will occupy three years.

Volunteer services—The committee on illiteracy.

In addition to these official studies the Office of Education is taking part in three important volunteer services by outside groups. The major volunteer efforts have been those of the committee on illiteracy, which has before it one of the most promising tasks in the field of education, and whose research and statistical work is under way, and the committee on education by radio. The advisory committee on education, already discussed, is a completely independent organization, to which the Office of Education bears only a cooperative relationship.

Radio.

The committee on education by radio has developed some unique data which will help in establishing a foundation for this new and almost untried field. Its report presents a clear analysis of the opportunities and problems, and should be referred to by those interested in the field.

Cooperative work.

The office has also cooperated in studies of engineering education with the Society for the Promotion of Engineering Education; the development of a series of State histories of education, sponsored by a committee of the American Association of College Professors of Education; a study of college financial and statistical reports in cooperation with a committee of representatives of several associations interested in such reports; and a study of methods of publication of bibliographies of doctor's and master's theses in education.

NATIONAL PARKS

New parks.

The past year saw the transfer by the States of North Carolina and Tennessee of title to the United States covering 159,000 acres of unique mountain country which will be the beginning of the Great Smoky Mountains National Park. The Park Service has taken over the care of this area but it will not be organized as a national park until 427,000 acres have been acquired. The whole cost of \$10,000,000 is being borne one-half by the two States and one-half by the Laura Spelman Rockefeller Memorial.

This will be the first of the great national parks within easy motoring distance of the people of the East. Eventually Shenandoah National Park in Virginia and Mammoth Cave in Kentucky and probably the Everglades in Florida will be added. The only existing national park in the East is Acadia in Maine. Congress has also established the George Washington Birthplace National Monument at Wakefield, Va., and authorized the creation of the Colonial National Monument which will include Jamestown Island, part of Williamsburg, and Yorktown battlefield. In this small area are the landmarks of the beginning and the end of the colonial period.

Hawaii National Park was this year placed under exclusive Federal jurisdiction.

The Hoover Dam Reservoir area was reserved with a view to considering its possibilities as a national monument. Eventually it will be a great inland lake, nearly 100 miles long, through wild country, including the lower end of the Grand Canyon, and may possibly provide a transportation route for tourists traveling by car from Zion and Bryce Canyon National Parks to the dam.

Roads—Landscape planning.

Particularly impressive in the development of the national parks, especially from the standpoint of public use, was the putting into service during the past season of spectacular new mountain roads, particularly the Zion-Mount Carmel road. The full effectiveness of the landscape planning and the roadside clean-up work of the National Park Service in connection with roadway construction is beginning to be apparent.

Almost equally important was the elimination of dust from the highways. This nuisance has now been largely eliminated from Sequoia, General Grant, Yosemite, Crater Lake, Mount Rainier, Glacier, Yellowstone, Zion, and Grand Canyon National Parks. Oiling also was extended to the trails in several parks.

An interesting phase of road and other construction work in the Southwestern national parks and monuments was the employment of Indians as laborers and also on some specialized work. Navajos, Havasupais, Hualpais, and Apaches were employed.

As roads have improved, the importance of further delineation and protection of wilderness areas and forest lands has been emphasized, and plans toward this end are now going forward.

The liaison established last year with the Bureau of Fisheries of the Department of Commerce has already been productive of excellent results. Plantings of trout fingerlings and eyed eggs, on a scientific basis, were greater this year than before, and plants made last year resulted in improved fishing this year.

Education.

Something more than recreation must be furnished national-park visitors if these areas are to function to their fullest degree. Recreation is furnished in many places, while the greatest thing the parks can do is to furnish inspiration and increased knowledge. The superlative display of natural phenomena warrants its use as teaching material.

With the beginning of the present fiscal year the educational work, begun in a tentative way 10 years ago, has been established and is now entering a new period of progress. In this the establishment of the new branch of education in the Washington office of the National Park Service is an important step. Already its officers are at work studying the working organizations in the various parks and planning a correlation of all endeavors in this field. Especial care is taken in the selection of the park naturalists, permanent field men in immediate charge of the educational activities in the individual parks. There is still need to develop in the national park and monument system a program of actual scientific research work, which will be productive of data, artifacts, and exhibits of value in the interpretive work of the service.

Utilities.

At the conference of operators of the park public utilities, called in Washington last December, the importance of preparing broad-gage development plans was emphasized. Plans were later submitted by the operators in most of the major parks and in some cases improvements undertaken. It is hoped that sooner or later all developments throughout the system will be as complete and have the wide variety of service as that now available at the north rim of the Grand Canyon.

Completing the park system.

Now is the time to complete the national park system by the transfer where it can be done of Government lands containing natural features of outstanding value to the Nation; also several of the

larger national parks should have their boundaries revised in order to include adjacent territory which contains features that naturally belong to them. Particularly important are the proposals to add to the Grand Teton Park a portion of the Jackson Hole country and the region between it and Yellowstone Park. Another urgent project contemplates moving the eastern border of Mount Rainier Park to the summit of the Cascades. The importance of acquiring private holdings in all the national parks is again emphasized. Until this is done we can not be wholly effective in the protection and administration of these areas.

PENSIONS

During the coming year the Bureau of Pensions will no longer be with us, having been transferred to the new Veterans' Administration, as recommended by the President and this department. Its closing year in the Interior Department saw the increase of pensions to beneficiaries of the service in the war with Spain, the Philippine insurrection, China relief expedition, and the Civil War. Nevertheless, adjudication of pension claims was expedited, largely through the energetic improvements introduced by Colonel Church, including, for instance, the adoption of modern flat filing methods after several decades of use of the old bundle system.

The retirement legislation administered by the Pension Bureau was liberalized by changing the age limits and increasing the annuities, benefiting some 18,000 annuitants.

This bureau, in leaving, takes with it over 70 per cent of the annual Interior Department appropriation. While it was a part of this department its total expenditures exceeded \$8,000,000,000. It annually cost more than the estimated cost of Hoover Dam and the all-American canal. The obligation of the people to their veterans is none the less real because of the size of the burden, but it will be helpful to have the Pension Bureau grouped for the first time with the other veteran relief organizations (the Veterans' Bureau and the Soldiers' Home) so that the total annual cost of the care of our veterans, amounting to the largest single item in the Government Budget, may be dealt with on a scientific and uniform basis.

ALASKA

The process of gradual transfer to the Territory, itself, of as much of the administrative responsibility now administered from Washington as may be practicable, will continue during this year. Already the administrative division of the Office of Education has been transferred from Seattle to Juneau and the responsibility for the reindeer industry transferred to the Governor of Alaska from the Office of Education in Washington. The President has appointed an interdepartmental commission composed of resident representatives of the Departments of the Interior, Commerce, and Agriculture. This commission is to study and report on the transferring of departmental activities to Alaska and in advising on changes in operations which will benefit the Territory.

The various problems of Alaska are being studied with a view to assisting the economic development of its immense resources and readjustment of its administration so the Territory will be self-supporting and prepared within itself to move forward in its development as the other Territories of the United States have in the past. Alaska's abundant pulpwood—enough to supply a billion board feet each year on a sustained yield—still lies idle; the forests are dying of old age; 450,000 horsepower of cheap water power near tidewater is going to waste. Accessibility is the greatest need; an international highway from Seattle to Fairbanks is being pressed vigorously and is a real necessity if Alaska's resources are to become available. Increased industrial training of the Eskimos and Indians will be pressed so these natives will be gradually altered from wards of the Government to producers of export commodities.

One thousand two hundred and eighty reindeer have increased to over 600,000 in 40 years. A great meat export and by-products industry awaits development by capital, and this will be actively promoted. It is considered advisable to encourage the local production of finished products and quartz mining so as to assist in stabilizing the winter labor market.

There are to-day about 70 prepared aviation fields in actual service and about 30 regular commercial planes are using points on the Alaska Railroad as a supply base from which they handle commerce with regions hundreds of miles in every direction. Aviation will be encouraged. Tourist travel to Mount McKinley Park and the interior will be especially recommended.

The Alaska Railroad will continue to show a deficit until capital flows into the country and develops mines and other resources leading to traffic. No matter how good the management, traffic must precede profit. The railroad will continue to be operated as the greatest development factor in the Territory.

HAWAII

- The Territory of Hawaii has the many problems of any new growing country, but, under the law, few of them come to the door of this department. During the past year we have attempted to help work out the Territory's land problems with the other Federal departments, and will continue to keep up a helpful liaison without interfering in this Territory's local affairs.

COLUMBIA INSTITUTION

This excellent school for the deaf presents a problem of jurisdiction; it represents one of the few activities of the Federal Government in the national field of direct education. Its justification has rested in the fact that the deaf are not in sufficient numbers in any one State to justify special State colleges for them. It has offered a wide course of studies for a student body of 76 men and 55 women; 64 primary and grammar-grade students were also enrolled.

NEGRO WELFARE

HOWARD UNIVERSITY, FREEDMEN'S HOSPITAL, EDUCATION

Negro welfare will receive added attention through three activities of this department during the coming year.

Howard University will have under construction a \$200,000 classroom building and two new girls' dormitories, which will cost \$539,000.

Freedmen's Hospital will receive a new building for its obstetrical department, costing \$153,000.

In the Office of Education a specialist has been added to carry on research in negro education.

ST. ELIZABETHS HOSPITAL

The United States was caring for 4,503 mental patients on June 30 at St. Elizabeths. A new building costing \$875,000 is being completed and a \$1,050,000 building program is beginning. This hospital costs about \$4,000,000 a year.

PART III: THE PAST YEAR'S WORK IN BRIEF

There follows a summary of the report of each officer reporting to the Secretary of the Interior. These reports are printed separately and may be obtained on application to the Department of the Interior. The tables printed in these separate reports are not reprinted here.

The activities covered:

The Solicitor's Office.

Board of Indian Commissioners.

Bureaus:

General Land Office.

Office of Indian Affairs.

Pension Office.

Office of Education.

Geological Survey.

Bureau of Reclamation.

National Park Service

Territories:

Territory of Alaska.

The Alaska Railroad.

Territory of Hawaii.

Institutions:

St. Elizabeths Hospital.

Freedmen's Hospital.

Howard University.

Columbia Institution for the Deaf.

Extra-Departmental Activities:

American Antiquities.

General Education Board.

Fuel Administration; Coal Commission.

Perry's Victory Memorial Commission.

THE SOLICITOR

SUMMARY OF REPORT

A total of 396 new suits were instituted in the Supreme Court of the District of Columbia against the Secretary of the Interior during the year, which, with the 30 suits pending on July 1, 1929, made a total of 426 suits which were handled by this office during the year. Of the number, 392 were pending on June 30, 1930.

Under the act of Congress of February 13, 1929 (45 Stat. 1166), 346 suits were filed seeking to obtain a court review of the department's action relative to claims for losses under section 5 of the war minerals act of March 2, 1919 (40 Stat. 1272). Of these, five were tried. The court, after reviewing the disposition of said claims, held that the questions of law raised by the petitioners had been properly adjudicated by the Secretary of the Interior. Appeals to the Court of Appeals have been filed and are pending in four of said decided cases. These are in the nature of test cases, as they

involve the principal issues, and it is believed their final decision will govern the disposition of the most of these war minerals cases.

Also, during the year, there were filed in the same court 38 suits, the object of each being to obtain a writ of mandamus to require the Secretary of the Interior to take action in effect recognizing a right in petitioner to be given an oil and gas prospecting permit under the act of February 25, 1920. These cases are intended to test the legality of the authority exercised by the Secretary in effectuating the administrative policy announced by President Hoover on March 12, 1929, that—

There will be no leases or disposal of Government oil lands, no matter what category they may lie in, of Government holdings or Government controls, except those which may be mandatory by Congress. In other words there will be complete conservation of Government oil in this administration.

Pursuant to the announcement of such policy, on the morning of the following day, the Secretary sent the following telegram to registers of land offices:

No oil and gas prospecting permits will be issued on and after March twelfth, nineteen twenty-nine. Reject all applications for oil and gas permits now pending in your office and receive no more. All orders for drawings hereby revoked.

SPRY, *Commissioner*.

Approved:

RAY LYMAN WILBUR, *Secretary*.

This was followed within a few days by formal Orders 336, 337, and 338, containing detailed directions which have been complied with, and, for the time being, have discontinued the further issuing of such permits. Whether such action was within the broad discretionary power of the Secretary of the Interior, or effected a temporary withdrawal of public lands subject to prospecting, are the questions involved in the suits. Eight of these have been tried and decided adversely to the contentions of the Secretary. They were appealed and are now pending in the Court of Appeals of the District of Columbia.

During the year 12 other cases were filed.

There are pending in the Court of Appeals of the District of Columbia 14 appeals in which the department is involved. During the year that court disposed of 4 cases to which the Secretary was a party, deciding 2 in his favor, 1 against him, and the other was dismissed upon an amicable settlement of the issues out of court.

The following shows the other work performed by the office:

	Public-land matters		Pension matters		Retirement matters		Indian matters	Miscellaneous matters
	Appeals	Motions	Appeals	Motions	Appeals	Motions		
Pending July 1, 1929.....	730	23	165	3	10	1	20	23
Received during the year...	1, 142	142	880	40	48	9	12, 906	17, 293
Total	1, 872	165	1, 045	43	58	10	12, 926	17, 316
Disposed of during the year..	1, 132	149	937	38	50	10	12, 903	17, 283
Pending June 30, 1930..	740	16	108	5	8	0	23	33

"Miscellaneous matters" includes the following:

Formal opinions of the solicitor.....	92
Correspondence relative to proposed legislation.....	813
Contracts.....	1, 136
Requests for instructions on questions of law, proposed circulars, preparation of suits for the Department of Justice, etc.....	602
Preparation of letters for the Secretary and Assistant Secretaries involving questions of law.....	1, 243
Cases submitted to the board of equitable adjudication.....	1, 239
Applications for repayment.....	228
Applications for permits to prospect for oil, gas, and coal.....	320
Applications for leases (oil, gas, coal, potash, etc.).....	120
Assignments of leases and permits.....	201
Cancellation of prospecting permits and leases.....	9, 195
Applications for coal licenses.....	15
Extensions of coal and oil and gas permits.....	2, 084
	17, 293

BOARD OF INDIAN COMMISSIONERS

SUMMARY OF THE REPORT OF THE BOARD (A BODY NOT AFFILIATED WITH THE INDIAN SERVICE, ACTING IN AN ADVISORY CAPACITY)

In its sixty-first annual report to the Secretary of the Interior, the Board of Indian Commissioners states that during the fiscal year much of the groundwork was laid by the Commissioner of Indian Affairs for putting into effect the Secretary's general progressive program for Indian administration. In outlining this phase of Indian Office work the board's report says:

In formulating plans and methods the commissioner and his advisers made it quite clear that they were not engaged in the business of upsetting the Indian Service structure, but instead were holding to the purpose of using every activity and function which could be made to fit in with the general policy program of acceleration and expansion. Progress was to be made step by step and not to be attempted by sensational leaps and bounds, but new organizations are in the making, larger activities are getting under way, the personnel is going through some rearrangements and buildings operations are in progress. Much of the new work must wait until the augmented funds of the 1931 acts are available.

The board points to the increased appropriations for the use of the Indian Service during the 1931 fiscal year as evidence of the cooperation of Congress with the Indian Office. It shows that during the last decade Congress has increased its money grants for the Government's Indian business nearly 100 per cent; that in the past 10 years the appropriations for education alone have grown from \$4,475,000 to more than \$10,000,000, and that the grants for the Indian medical service have expanded from \$350,000 to \$3,188,000, an increase of more than 800 per cent. Commenting on this growth of appropriations the board says:

These are significant comparisons. They show that Congress and the Indian Bureau, in a large sense, are partners in the endeavor to hasten the general advance of the Indians. The cooperation is evident, even though the Indian Bureau too often, for settled ease of mind in the Indian Office, has been taken severely to task and roundly scored on the floor of Congress. But, by and large, for 20 years at least, and particularly during the past decade, a spirit of willing cooperation has characterized the relations of Congress with the Indian Bureau. It is disclosed in the continuing growth of Indian Service appropriations and is emphasized by the \$5,000,000 increase of the 1931 money grant over that of 1930.

The law-and-order situation on Indian reservations is reviewed in the board's report. In presenting this matter the board says:

The Congress and the Indian Bureau should take action promptly and positively to bring about the maintenance of law and order in every jurisdiction of the Indian Service. Further delay in adopting a firm policy and enacting proper legislation to make every Indian under Federal supervision amenable to the law of the land is no longer excusable. The irresolution which has characterized the attitude of the responsible legislative and executive officials of the National Government toward this fundamental Indian problem should be supplanted by a determination to tackle this question with vigor and resolution.

The board reports that during the year it secured the opinions, suggestions, and recommendations of 59 agency superintendents on the reservation law-and-order problem. It says that all but two of them expressed the opinion that the Indians under their supervision have advanced sufficiently to be made subject to State laws; that 30 superintendents believe the State laws should be administered by State and county courts and officials; that 27 are in favor of the administration of such laws by Federal courts and officials, while 2 think their Indians are still so primitive that they should be kept under Federal law and administration.

As respects reservation courts of Indian offenses, 37 superintendents report such courts are in operation in their jurisdictions; 32 commend them and five express doubt as to their effectiveness. Most of the superintendents present the suggestion that because Indian trust property does not pay taxes some arrangement should be made for the Federal Government to reimburse State and county courts and their law-enforcement organizations for expenses incurred in handling Indian cases.

Among other suggestions and recommendations presented in the board's report are the following:

We have heretofore recommended that the Indian Office should be reorganized within itself; that the chiefs of the divisions should be given much more executive authority so that they can handle all of the purely administrative affairs of their respective divisions without passing them up for final determination to the commissioner's desk.

That the agricultural and industrial possibilities of each reservation should be determined through a careful and comprehensive survey made by a commission or committee, or whatever it might be called, to decide what program should be followed with relation to the economic, medical, educational and other activities; that a definite program should be outlined covering a period of from 5 to 15 years or so; and that the adopted plans should be followed continuously notwithstanding changes in superintendents.

We recommend that in filling vacancies in the reservation superintendent class no person should be appointed until he has had enough experience in the field service working with as well as for Indians to demonstrate that he can hold down the job as the executive and administrative head of a reservation unit.

The outstanding cooperation between the United States Public Health Service and the Indian medical service prompts the suggestion that the Public Health Service, in accordance with the authority conferred on that organization by the Parker Act (Public, No. 106) of the Seventy-first Congress might be able to detail 10 or more of its officers to the Indian Service. We, therefore, strongly suggest that the Commissioner of Indian Affairs take up this matter with the Surgeon General of the United States Public Health Service with the hope that a joint effort will result in giving the Indian medical service 10 or more of the highly trained and specially fitted physicians in the United States Public Health Service.

Chairman Leavitt, of the House Committee on Indian Affairs, has introduced a bill providing for a United States court of Indian claims. It received the general approval of the Department of the Interior, but not of the Attorney General. The Board of Indian Commissioners indorsed the Leavitt bill and recommended its passage. We repeat our indorsement and recommendation. We hope that the bill will be given a full hearing by the appropriate committees of Congress.

On many reservations the incomes derived from oil, grazing, timber sales, etc., are used to pay the expenses of agency administration. Where the resources are large, such as those of the Osage and Klamath Tribes, it is quite proper, in our opinion, that the tribal funds so derived shall be employed to pay the administrative expenses incurred in managing the affairs of such Indians. Where Indians are poor, however, such revenues might better, we believe, be used for the improvement or development of Indian property rather than for the payment of agency expenses.

THE BUREAUS

GENERAL LAND OFFICE

SUMMARY OF THE COMMISSIONER'S REPORT

Necessity for additional funds.

The Commissioner of the General Land Office reports that there has been a constant increase since 1926 in the area embraced in original selections, filings, and entries, and that the time has come when there must be an increase in the number of employees if the demands of the public are to be properly met in the disposition of the work before the office. The area embraced in original entries during the last fiscal year was 5,434,550 acres, as against 4,612,722 acres for the year 1929. During the same period the cancellations of entries theretofore made, both through relinquishments and through expiration of the statutory periods, were less than in the preceding year. There were embraced in unperfected entries, selections, and locations at the close of the year 22,533,574 acres, as against 21,347,505 acres at the close of the previous year. It is stated that while the work of the office may as a rule be gaged by the area embraced in existing entries, selections, and filings at the beginning and those received during the year, the cooperative work with other bureaus and departments depends upon their initiative, and that these emergency demands on the public service not only interrupt the routine handling of applications, entries, selections, and other filings but render it impossible to accurately estimate the work to be assigned to the various employees during a fixed period. Illustrative of these unusual demands on both the field and the office forces, reference is made to the field examinations and subsequent adjudicative work to clear the records of speculative mining locations in the area to be flooded by the Hoover Dam; also the field examination and office adjudication of oil shale mineral locations in Colorado, Utah, and Wyoming, and the compilation of data involving immense areas for the Department of Justice and the General Accounting Office in connection with a large number of suits by Indian tribes now pending in the Court of Claims. The three classes of work specifically mentioned partly performed during last year will last several years.

Forest fires.

The fire hazard in the timbered sections of the Northwest and the Pacific Coast is very great. Heretofore this department has scarcely met its just share of the expenses for fire protection when the amounts paid by private interests and the several States are taken into consideration. The Government should protect its timbered property and not depend on the States to perform that service. The best method is to cooperate with the States and with the individual holders of timbered lands for fire protection and larger amounts should be made available for this purpose.

Coal fires.

There are a number of fires in coal beds on the public domain, particularly in Colorado, Montana, North and South Dakota, Utah, and Wyoming, which have been smouldering for years. Some of them may ultimately extinguish themselves, while others, if unchecked, will burn indefinitely and destroy enormous quantities of easily accessible coal. Some can be put out at small cost, while others are of such a nature that the fire ravage may be stopped only at great expense. Every effort should be exerted toward the conservation of our coal deposits. A special appropriation should be provided for the prevention and suppression of fires in coal deposits on the public lands, to be immediately available and to continue available until expended.

Receipts and expenditures.

The total cash receipts from sales, leases, and other disposition of the public lands (including receipts from copies of records, sales of government property, etc.) were \$6,492,720.20, and from sales of Indian lands \$308,689.75, an aggregate of \$6,801,409.95, all of which was deposited in the Treasury. Subject to final settlement of all accounts by the General Accounting Office, the money will be distributed approximately as follows: Reclamation fund, \$3,167,701.64; to the public-land States and to certain counties within such States, \$2,405,078.63; to the Indian tribes, \$274,386.72; and to the general fund of the Treasury, \$954,342.96.

Total expenditures for the conduct of the business of the General Land Office and its field activities, including expenses of the district land offices (\$281,235.79), amounted to \$2,222,785. Disbursements from deposits by individuals for surveying public lands (\$39,615.23) and from appropriations and funds for surveying Indian reservations (\$73,625.40) are not included in the above figure, either as receipts or expenditures.

Area of land entered and patented.

The total area of public and Indian lands embraced in original entries allowed during the year was 5,434,550 acres, not including 74,442 acres embraced in public auction sales, timber and stone entries, mineral entries, and other items embraced in final entries of classes not theretofore counted as original disposition of land. Of the total area embraced in allowed original entries, 4,125,120 acres were allowed under the stock-raising homestead act of 1926. The area patented was 1,892,475 acres, including 1,433,905 acres patented under the homestead laws.

Field service.

The field examiners investigated and reported upon 16,860 cases, of which 5,226 reports were adverse to the claimants and 11,634 were favorable. There was a satisfactory reduction in the number of routine cases. Although 17,129 cases were awaiting field examination June 30, that amount of pending work was due principally to the initiation shortly prior thereto of a large number of emergency investigations in the Hoover Dam Reservoir area and in the oil shale areas of Colorado and Utah.

The total amount of cash collected as the result of the work of the field examiners was \$81,306.63. There were restored to the public domain 129,438 acres, representing fraudulent entries canceled on administrative proceedings based on field examiners' reports. Civil suits brought through the Department of Justice and criminal prosecutions instituted upon recommendation of the field service resulted in the recovery of \$1,111.87 additional, the restoration of 4,315 acres to the public domain, and 29 indictments. Of the criminal cases tried 22 resulted in conviction.

The appropriation for protecting public lands, timber, etc., for 1930, provided an allotment of \$40,000 for the prevention and suppression of forest and other fires on public lands. A total of \$47,151.41 was expended or obligated for that purpose, or \$7,151.41 more than the allotment. This excess was paid from funds provided by a deficiency appropriation. At the beginning of this fiscal year, or from July 1 to September 30, 1929, there were employed 58 forest patrols and lookouts. During the fire hazard season of 1930, or during the months of May and June, no patrols and lookouts were employed except 3 in Alaska, because of the exhaustion of the appropriation.

Surveys.

The public land survey was extended in 22 States and the Territory of Alaska. Such of these surveys and resurveys as are measurable on a quantity basis aggregated 15,911 linear miles, at an average

cost of \$25.04 per mile. In addition, miscellaneous surveys, including work for and in cooperation with other Federal agencies, were executed in every part of the public domain. Over 1,600,000 acres of agricultural lands were surveyed and resurveyed in the various Western States, principally in Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, this work being done upon the application of settlers and the States to accommodate entries under the dry-farming and stock-raising homestead acts and to provide for State selections. Operations on a more extensive scale planned under this classification were necessarily curtailed by the detail of seven chiefs of party to the field service to run lines and assist in the identification of the lands under examination in the oil shale fields of Colorado and Utah. In the nonagricultural and mineral classification there were accomplished the extension of exterior lines over large areas in southeastern Utah in order to provide a basis for the description of oil placer claims, the resurvey of over 20,000 acres of oil shale land in western Colorado, and the survey of approximately 23,000 acres and resurvey of 7,000 acres of railroad lands in California. Cooperative surveys were executed for the Forest Service to the extent of 900,000 acres of forest lands, the National Park Service, the Bureau of Reclamation, the Geological Survey, and the Biological Survey. Under the appropriation for surveying and allotting Indian reservations and other Indian funds over 250,000 acres were surveyed or resurveyed on Indian reservations. Miscellaneous surveys were also executed for the War Department, Federal Power Commission, and International Boundary Commission. In addition, over 1,142,000 acres were included in resurveys made necessary in the older localities by obliteration of monuments, incongruities, and erroneous and fraudulent surveys, relics of the early days when Government surveys were executed under contract. There were accepted and placed on file plats representing 1,599,828 acres of original surveys and, in addition, 1,448,699 acres of land resurveyed, comprising an aggregate area of 3,048,527 acres.

Map making and drafting.

The map of the United States, 1929 edition, has been published. This edition differs from previous publications in that the different acquisitions of territory are shown in solid colors. The State maps of Nevada and Louisiana are in the hands of the contractor, being printed. Work is progressing upon the recompilation of the maps of the States of Idaho and Wyoming; also upon the revision of the map of Wisconsin. A new map of the Hawaiian Islands was compiled and the map of the United States west of the Mississippi showing the activities of the Department of the Interior was revised, and

both published during the fiscal year. The map of Alaska to accompany the report of the governor of the Territory was revised and published. Numerous detailed maps have been prepared within the States of Iowa, Kansas, Wisconsin, Minnesota, Missouri, Nebraska, North and South Dakota, Wyoming, and Montana, based upon Executive orders and treaties beginning with the year 1805, for the use of the Department of Justice in connection with the suits brought by the Sioux and other Indians to recover the value of large areas of lands for which the Indians claim they have never been compensated. This is a continuation of the work undertaken during the previous year.

There were sold 19,293 photolithographic copies of township plats, for which \$9,754 was received, and 8,982 copies were furnished other departments for official use.

Homestead and related entries.

There were approved for patenting 6,727 homestead entries. There were also considered 5,509 original entries and final proofs thereon, 1,742 applications to make second homestead entry, 833 applications to amend, 773 applications for leave of absence and for extension of time in which to establish residence, and 21,078 appeals from the action of district land offices and of the General Land Office, making a total of 29,935 items, as against 28,123 the previous year. Timber and stone cases acted upon numbered 284, of which 152 were approved for patenting, and 1,075 applications for public sale of isolated tracts were received for action. Considerable other work which can not be reflected by figures was performed in connection with entries, applications, and other filings involving lands within those States having no district land office.

Stock-raising homesteads.

Final stock-raising homestead entries to the number of 2,530, involving 1,057,262 acres, were patented with a reservation of all minerals to the United States. Since the passage of the stock raising act 57,609 patents thereunder have been issued, covering an aggregate of 21,289,660 acres.

Stock driveways.

The area withdrawn during the year for that purpose amounted to 170,552 acres, and that released from such withdrawals, 9,872 acres. The total area included in stock driveway withdrawals at the close of the year was 9,443,655 acres.

Mineral entries and locations.

During the year 256 entries under the mining laws were patented and 917 mineral entries were received for action. The work on oil

shale mining locations has been materially increased since the decision of January 6, 1930, by the Supreme Court of the United States in the Krushnic case (280 U. S. 306), and action involving challenging by posting was taken on approximately 4,000 claims during the fiscal year. This involves but a portion of the claims on which action will be required in the near future.

The passage of legislation by Congress providing for the Boulder Canyon project made necessary the examination and adjudication of mineral locations within the Hoover Dam and reservoir site which has increased the work without increasing the number of employees. On June 1, 135 field reports were pending and 526 were received during the month, making a total of 661 awaiting action on June 30.

Oil and gas.

There were 84 cases on hand involving leases and relief applications under sections 14, 18, 18a, 19, and 22 of the mineral leasing act of February 25, 1920. During the year 740 cases were received for consideration and 74 leases were granted. Under section 14 of the act, which authorizes leasing to permittees who show a discovery of oil and gas as the result of prospecting under a permit, 73 leases were issued covering 35,000 acres. Under section 17, authorizing public sale of leases, one lease was issued. Other sales were authorized during the year but leases have not yet been consummated. Bids were called for on royalty oil produced in the Kettleman Hills oil field, California, from two wells. One hundred and thirty-three applications for prospecting permits were reinstated, 150 permits which had been canceled were reinstated, and 199 new permits were granted. Final action was taken on 206 applications for permit, 379 assignments of permits were acted upon, and 6,785 applications for extension of time were disposed of. During the year 4,474 permittees were called upon to show cause why their permits should not be canceled and 8,358 prospecting permits were canceled; 4,390 cases were examined on which further action was necessary, leaving 874 pending at the close of the year.

Miscellaneous permits and leases.

Sixty-eight coal prospecting permits were issued, 29 coal leases, and 15 coal licenses; 41 potash permits, 3 potash leases, and 30 sodium permits.

Receipts under the mineral leasing act.

Receipts from bonuses, royalties, and rentals aggregated \$4,739,-095.67. The largest receipts were obtained from leasing mineral lands in Wyoming, the amount being \$3,274,459.06, and in Cali-

ifornia with \$1,009,373. Smaller amounts were received in Montana, Colorado, Utah, North Dakota, Alabama, Louisiana, Idaho, Washington, Nevada, and South Dakota, in the order mentioned.

Restorations and openings subject to preference right of ex-service men.

There were opened to entry through release from segregation or withdrawal 254,567 acres, and through survey or resurvey 547,626 acres.

Miscellaneous leases.

During the past few years Congress has enacted laws providing for the leasing of vacant public land for various purposes. Some are issued on a rental basis, while in others the lease is for the purpose of aiding some public development. Leases for public airports were issued to Rawlins, Wyo.; Milford, Utah; the Chamber of Commerce of Ajo, Ariz.; and to Florence, Ariz. Nine fur-farming leases in Alaska were issued, assignments of two such leases were approved, and two leases were canceled; 177 applications for such leases were considered and 60 applications are awaiting reports of field examination. Consideration was given to 145 applications for grazing leases in Alaska, 1 lease was issued, and 80 applications are now awaiting reports from the field. A lease was issued to the Boy Scout Camp in Douglas County, Oreg., under the act of January 21, 1927. Twelve applications for leases of public lands in connection with mineral, medicinal, or other springs were considered and two applications remain intact awaiting field division reports.

State, county, or city recreational areas.

Fourteen withdrawals were made for recreational classification, aggregating 258,020 acres, based on 1 municipal, 4 county, and 9 State petitions. One tract was purchased under the recreational law and 3,893 acres were classified as nonrecreational and released from withdrawal.

National forests.

There are now 149 national forests embracing 183,975,930 acres, of which a little over 86 per cent is public land. Enlargements, reductions, and other changes effected a gross addition of 404,029 acres and an exclusion of 993,052 acres.

Railroad rights of way.

One hundred and ninety-five railroad right-of-way applications were received, 48 approved, 8 canceled, 37 otherwise disposed of, and requirements made in 101 cases.

Other rights of way.

Six hundred and seventeen irrigation and miscellaneous right-of-way applications were received; 155 were approved, 24 canceled, and interlocutory action taken in 441 cases.

Forfeitures.

The number of approved rights of way of all kinds awaiting office action July 1, 1929, was 31, which together with 676 received, totaled 707. Of these proof of construction was accepted on 89, there were canceled by relinquishment or default 79, requirements were made in 459 cases, and 50 were otherwise disposed of. Eight suits were recommended and nine decrees of forfeiture obtained as the result of previous recommendations.

Dam site, San Gabriel Canyon, Calif.

The controversy over a dam site in the San Gabriel Canyon between the city of Pasadena and the Los Angeles County flood-control district was settled and the city's application for a right of way for a reservoir site was approved.

Hydroelectric power.

Ninety-two power-project applications were transmitted to the General Land Office by the Federal Power Commission, involving public lands and lands within national forests in 12 States and the Territory of Alaska.

United States reclamation projects.

Original reclamation homestead entries on reclamation projects pending at the beginning of the year were 55 and there were received 588; there were examined and accepted 52; canceled, 47; claimants called upon for additional evidence in 288 cases; and otherwise disposed of, 200. Over 300 assignments were considered; also 28 desert-land entries and 285 final reclamation homestead entries were approved for patenting.

Reclamation withdrawals and restorations.

There were promulgated 40 orders of restoration and 16 orders of withdrawal under the reclamation act.

State irrigation districts.

Since the passage of the acts of August 11, 1916, and May 15, 1922, applications by 73 districts for approval have been received. During the year 2 applications involving a total of 48,720 acres were rejected. One application is awaiting further evidence on behalf of the district. Since the enactment of the legislation applications by 58 districts, embracing a gross area of 2,432,258 acres, have been approved, and applications by 16 districts, involving 323,408 acres, have

been finally rejected. Interlocutory action on all districts during the year involved 201,158 acres.

Private irrigation projects.

Six reports were received as the result of investigations of private irrigation enterprises upon which claimants and applicants under the desert land laws were depending for their water supply, making a total of 1,407 such projects reported upon since the adoption of the regulations of September 30, 1910.

Desert lands.

The disposals are summarized as follows: Desert land entries approved, 548; canceled, 385; requirements made, 1,361; otherwise disposed of, 792; pending at close of the year, 287.

Carey Act.

Withdrawals, segregations, and patent applications under this act amounting to 254,912 acres were considered, and either interlocutory or final action taken upon 183,577 acres thereof.

Pittman Act.

Two hundred and thirty-two Pittman Act applications and permits were before the office for action; 85 were approved, 45 canceled, and requirements made in 82 cases.

Swamp lands.

During the year there were patented under the swamp land act 7,695 acres to the several States entitled thereto. Selections involving 7,695 acres await consideration.

Withdrawals and restorations.

During the year 10,235,409 acres were placed in a state of reservation either by Executive order or departmental order, and 554,021 acres theretofore reserved were restored to entry or other disposition. Among the outstanding executive withdrawals was that of approximately 400,000 acres in Owens Valley and Mono Lake Basin, Calif., in aid of proposed legislation authorizing the sale of the lands to the city of Los Angeles, or their permanent reservation to protect and augment the city's water-supply system.

Contests.

Two thousand nine hundred and ninety-one records in contested cases were received and decisions rendered in 2,330.

Indians and Indian lands.

Fee patents to the number of 1,501, and 460 trust patents were issued. The compilation of data concerning ceded Indian reservations involved in suits before the Court of Claims was completed in the Great Sioux, Fort Berthold, Otoe Missouria, Rosebud, Stand-

ing Rock, Blackfoot, Pine Ridge, and Yankton-Sioux Indian Reservations. While not completed, progress has been made in the preparation of similar data affecting nine other reservations.

Pueblo Indian lands.

Instructions were issued on April 17, 1930, defining the procedure to be followed for the issuance of patents for lands within the tracts confirmed and patented to the Indian pueblos in New Mexico. The excepted tracts found by the decisions of the Pueblo Lands Board to be held by non-Indians under valid and indefeasible title as against the titles of certain pueblos have been surveyed and after publication of notices of the filing of the plats of such surveys patents will be issued.

Ceded Indian lands.

All unperfected entries and purchases of land in the former Cheyenne River and Standing Rock Reservations were acted upon subsequent to December 1, 1929, either allowing a year's extension, accepting relinquishment, or canceling the entry. Three thousand five hundred and twenty cases of ceded Indian lands were considered.

State grants and selections.

Title was conveyed to the various States covering 274,230 acres involved in indemnity selections, and 113,146 acres of quantity selections. The work under quantity grant selections increased during the year, which increase will continue because of recent grants made by congress, such as 250,000 acres to New Mexico, 50,000 acres to Arizona, an exchange grant of 30,000 acres to Nevada, and others, under which grants the States have recently begun to make their selections. Conveyances amounting to 38,143 acres were made to the States with reservation of certain mineral deposits to the United States, including coal, phosphate, nitrogen, potash, oil and gas or oil shale.

School sections.

Under the act of January 25, 1927, granting mineral school sections to the several States, it is incumbent upon this office to determine whether the various school sections pass to the States under the original granting acts as nonmineral land or under the provisions of said act of 1927 as mineral land. During the year it was held that title remained in the United States to 12,765 acres; that 100,795 acres had passed to the States under the original grants and 29,981 acres under the act of January 25, 1927, and that as to 37,521 acres title was in the States under either the original grant or the act of January 25, 1927.

Railroad grants and selections.

Selections were received to the extent of 273,043 acres, and during the same period there were certified or patented in satisfaction of such grants 73,311 acres and 66,552 acres of selections were rejected, the total acreage adjudicated being 463,906.

Northern Pacific Railway Co.

The act of June 25, 1929, declared a forfeiture of certain claimed rights of the Northern Pacific Railway Co. and directed the institution of proceedings looking to adjustment of the grant. Responding to the request of the Attorney General a considerable number of special maps and diagrams, copies of various papers, and approximately 100 intricate tabulations covering some of the points involved were prepared and transmitted to the Department of Justice. Other diagrams and tabulations are still in course of preparation.

Railroad adjustments.

The work of adjusting 10 railroad grants was completed. Adjustment of the grant to the Union Pacific Railroad Co. (main line) is progressing rapidly.

Revested Oregon & California Railroad and Coos Bay Wagon Road grant lands.

Under the act of June 9, 1916, there were conducted 99 sales of timber on the Oregon & California Railroad grant lands, involving 9,565 acres containing 285,019,380 feet b. m. of timber, for which \$499,840.52 was received. Total sales to date, \$5,652,590.09. The Coos Bay timber sales embraced 135,560,000 feet of timber on 2,242 acres of land, for which timber the sum of \$263,657.50 was received. Total sales to date, \$1,571,904.84. Revested lands within the Lakeview and Roseburg land districts to the extent of 3,775 acres were restored to homestead entry, which with restorations theretofore reported make a total of 1,084,075 acres. Under the act of July 13, 1926, there was paid to the counties involved, in lieu of taxes on the revested lands, the sum of \$588,243.50. There was also certified for payment to four of the counties in conformity with the opinion of the Attorney General, the total sum of \$178,601.73 which had been disallowed in the claims of 1916 to 1928, inclusive.

Town sites.

There were considered 1,050 town-lot cases and 284 patents were issued. Because of the long delay in the issuance of patent to purchasers of lots in Harding Townsite, Fla., caused by litigation, an extension of time until December 31, 1930, was granted to all purchasers of lots who are in arrears.

Alaska.

Seventy-one applications for the sale of trade and manufacturing sites were considered and six patents issued, the remainder being intact awaiting the survey of the tracts or submission of final proof by the claimants. Three applications for sale and export of timber were filed and await reports from the field, and one sale was approved involving 40,000,000 feet of timber from approximately 500,000 acres. Eleven applications for the purchase of 5-acre tracts were considered. Fur-farming and stock-grazing leases in Alaska are covered under the general head of "Leases," while Alaska town lots are grouped with others in the States under "Town sites."

New laws.

Memoranda or proposed reports were prepared on a total of 210 bills, of which 82 became laws, and instructions or regulations affecting 73 of such acts were promulgated.

Forest lieu selections.

Three hundred and thirty-eight forest lieu selections were considered and 53 patents issued. The larger number of the remaining cases are for unsurveyed lands and await survey.

Forest consolidations.

Exchanges of privately owned lands within the boundaries of national forests for Government lands or timber within other forests in the same State were considered to the number of 807, resulting in the issuance of 53 patents.

National parks.

Completion of the exchange of 1,010 acres of public lands in the Yosemite National Park for 1,350 acres of privately owned lands adjoining the park for the purpose of protecting the deer awaits survey of part of the lands involved. An exchange of 27.12 acres of public land for 48.55 acres of private land for use in connection with the Grand Canyon National Park was completed, and regulations were approved under the act of April 19, 1930, providing for the exchange of public land for privately owned land for use in connection with Lassen Volcanic National Park, Calif.

Scrip, warrants, etc.

Nine hundred and fifty-eight cases involving soldiers' additional homestead rights, commonly called soldiers' additional scrip, were considered and 57 patents issued, and consideration was also given to 133 other applications to locate various classes of scrip. While only 10 applications to locate military bounty land warrants were received, inquiries as to the issuance and location of such warrants were received to a considerable number from persons seeking membership in various patriotic organizations.

Color of title.

Fifty-seven color of title cases under the act of December 22, 1928, were considered, 8 under the act of April 15, 1920, as to Utah, and 10 under the act of February 16, 1929, as to Michigan.

Small holding claims.

One hundred and eleven small holding claims in New Mexico were considered and patents issued in seven.

Erroneously meandered land.

Under the several acts providing for the disposal of lands originally erroneously designated as covered by water but subsequently found to be dry, 297 cases were considered and 18 patents issued. Some of the remaining cases await field reports and others the final disposition of conflicting claims.

Repayments.

There were stated 228 accounts allowing repayment of \$16,568.60, and 122 claims were denied.

Trespass.

Timber, coal, gravel, and turpentine trespasses to the number of 1,614 were considered; also 51 cases of the unlawful inclosure of public land.

Remaining public domain.

Exclusive of Alaska and the public lands included in Indian reservations, national forests and national parks, and withdrawn for water power, stock driveways, and other public purposes, the area of the public domain subject to disposal under the applicable public-land laws on June 30, 1930, was 178,979,446 acres, of which 128,301,266 acres are surveyed and 50,678,180 acres are unsurveyed.

OFFICE OF INDIAN AFFAIRS

SUMMARY OF THE COMMISSIONER'S REPORT

The report of the Commissioner of Indian Affairs covers the first year of incumbency of himself and his associates in office.

The commissioner invites attention to certain fundamental facts concerning the Indian, his history, inherited characteristics, his racial point of view, and relationship to our own existing civilization, to be considered in determining our own proper course of action in dealing with his affairs.

His conception of property and ownership is not the same as ours; he has little understanding of individual property rights in land, and no background affording him such understanding. His view of ownership has been limited to personal possessions but only such as met his traditional needs. The trait of acquisitiveness is undeveloped, and so far as this would constitute an incentive to personal effort, the motive for industry fails.

His interests have been in doing the things which his forefathers have always done and it is difficult to substitute for him a real interest instead in the activities of the white citizen. While inevitably the Indian must develop such interests as may enable him to become a component part of our organized civilization and be self-sustaining, we should not destroy what is best of his own traditions, arts, crafts, and associations, but encourage their development and survival. In assisting in his development we must build on his own inherited good traits.

It is suggested that these conditions indicate the need for the proper kind of social service for the Indian, a work which has been overlooked in the past in the struggle to protect the property rights of a minority race.

Total appropriations for the year were \$18,794,829, which was \$4,597,763 in excess of the total for the prior year. This amount included \$2,121,614 made available by the first and second deficiency acts, fiscal year 1930, these moneys being provided to meet additional urgent needs for both 1930 and 1931. These needs included an adequate food allowance for pupils, additional necessary clothing, additional personnel required for relief of the students in the schools, equipment, furniture, and dairy stock.

Concerning Indian education, there has been developed an organization for professional direction of educational activities embracing essential elements of a sufficient personnel therefor. Appointees were secured who by special training, preparation, and experience in educational administration were qualified to advise and assist in the formulation and conduct of an educational program for Indians. These appointments include an assistant director of education, a supervisor of secondary education, a supervisor of trade and industrial training, and two additional supervisors of home economics. In the particularly important field of agricultural extension the aid of the Department of Agriculture was sought and transfer of a qualified specialist obtained for direction of allied branches of this work. Since the close of the year the office has secured as director of education an educator of standing and experience in this field of work.

The extent to which good results are dependent on the more careful selection and placing of employees in the field service work with the Indians and in the schools was appreciated, and to accomplish this a field representative having special qualifications for work of this character was appointed to have advisory direction and supervision of the personnel.

Steps commenced in 1928 and 1929 to raise the standards of teaching and other educational service have advanced and considerable improvement in the teaching personnel has resulted.

Stress is laid on the education of the young children in the schools at their homes where these are available. Attendance of these children in the local public schools has been steadily increasing, and while final totals have not yet been compiled for the year the number is believed to be in excess of the total for the prior year. This policy of attendance in school at home involves elimination of the young children from the Federal boarding schools, the rapidity with which this can be accomplished being dependent on a number of factors such as home conditions, remoteness from public school facilities, ascertained needs for institutional care, health needs, and social deficiencies.

The amount of new construction in the Indian Service, both of hospital and school buildings, has necessitated a reorganization and enlargement of the construction division. A well qualified architect has been obtained from the Supervising Architect's Office of the Treasury Department to direct the work, and more complete plans, specifications, and estimates are now possible than heretofore. The staff has been increased by five persons, well trained in this class of work.

In the field of Indian industrial activities the policy has been continued of affording practical assistance and encouragement in the agricultural pursuits of those who must or who desire to depend

upon their lands for occupation and self-support. The director of extension work has been assisted by eight agricultural extension agents, each of whom has a specified territory which includes several reservations. A supervisor of livestock has been appointed to give attention and supervision to matters which relate to the stock industries. Seven home demonstration agents have been working with the Indian women in order to assist them in all that pertains to the making and conduct of a modern, well-kept home.

Continued progress has been made in the work of affording medical care and relief for the Indians. The health organization finds a gradually increasing response on the part of the Indians to the facilities which the service is offering to them, and this is due in part to educational effort which has been directed to this end.

While the medical service, its hospitals and facilities, have been and are being improved and extended, its work has been furthered by the interest shown and cooperation extended by other Federal, State, county, and local organizations in regard to the special Indian health problems. The United States Public Health Service has continued to detail personnel and to make available the service of medical officers, field directors, sanitary engineers, and of the National Institute of Health.

A considerable increase in total hospital capacity was secured during the year, distributed among many jurisdictions where the need has been evident. Emphasis is placed, however, on the need of physical improvements, increased diagnostic and treatment facilities as well as an augmented personnel, so that the standards of the Indian institutions may more nearly approach those of similar institutions providing like service for other citizens.

The regular nonreimbursable appropriation for health purposes in the sum of \$2,658,600 represented an increase of \$1,218,600 over that of the prior year, and in addition a deficiency appropriation of \$400,000 for urgent health demands was provided by the Congress.

Realizing the primary importance of suitable and permanent occupation or employment for Indians after leaving school initial steps were taken to develop a guidance and placement organization which may ultimately function effectively in the furtherance of this basic need. Coordination between the school and the placement organization is essential and will contribute to the proper direction of vocational effort. Several placement officers are now on the roll and have accomplished much good work within the respective territory assigned to each.

Sales of individual Indian lands, both for cash and deferred payments, aggregated 35,773 acres, comprising original allotments, for a total consideration of \$505,799, and of inherited lands 72,742 acres for a consideration of \$1,101,996. These represent a decrease

in sales and revenue derived therefrom as compared with the prior year. However, sales are not encouraged except where old, indigent, or afflicted Indians need money for support and assistance or where sales of part of an allotment will result in improvement of home conditions. In cases where heirs are not too numerous (four or less) and inherited tracts are susceptible of a fair and equitable division the policy is to favor partition, in order that younger and more able-bodied Indians, many of whom have not received allotments, may retain land for their own benefit and utilization.

The lands of the several Indian reservations in the western part of the United States are to an extent desertlike in character, and their utilization can be effected only by artificial irrigation. This has necessitated the planning and construction of irrigation projects and dams for impounding of water and the maintenance and operation of these projects when completed. An example of this work is found in the San Carlos project, Arizona, and construction of the Coolidge Dam, mentioned in the report of the Secretary for the prior year. Water for other uses is also developed by the service. Within the Navajo reservations in Arizona and New Mexico 100 new spring wells and reservoirs were developed during the year to provide water for improving the grazing ranges of the Navajos.

With approval of the Secretary, it has been directed that grazing activities on Indian lands are to be hereafter administered by the forestry branch of the Indian Service, and immediate steps were taken to so reorganize the work. Under supervision of representatives of the Forest Service other units will cooperate to the end that there may be conservation of future grazing values, range depletion relieved, native grasses gradually restored, and erosion of soil of Indian lands checked. The Interior appropriation act of May 14, 1930, contains the first specific authority for payment of rewards for information leading to arrest and conviction of persons setting forest fires in contravention of existing law.

PENSION OFFICE

SUMMARY OF THE ACTING COMMISSIONER'S REPORT

The report of the Commissioner of Pensions for the fiscal year ended June 30, 1930, shows that the disbursements for pensions for the year were \$219,203,540.82, as against \$229,889,986.48 the previous year, a reduction of \$10,686,455.66. The unexpended balance of the moneys appropriated and available for payment of pensions was \$1,374,341.50.

Of the amount disbursed, \$46,068,116.07 were paid to Civil War veterans; \$79,698,163.03 to Civil War widows; \$71,179,383.82 to Spanish War veterans; and \$12,381,648.69 to Spanish War widows. There was a decrease of \$17,827,810.58 in the amount paid on account of Civil War service, and an increase of \$6,715,328.23 in the amount paid on account of Spanish War service. The cost of maintenance and expense of the pension system for the year was \$1,272,203 as against \$1,276,512 for the previous year.

The total number of pensioners, June 30, 1930, was 464,257 as against 477,915 on June 30, 1929. Of the pensioners, 48,991 were Civil War veterans; 167,574 Civil War widows; 186,365 Spanish War veterans; 30,919 Spanish War widows. On account of service in Indian wars 5,454 soldiers and 4,191 widows were in receipt of pension. By reason of service-connected disabilities 15,661 soldiers were drawing pension, and 3,830 widows whose husbands had died of injuries or diseases of service origin. There were also on the roll 630 widows of Mexican War soldiers and 10 widows whose husbands served in the War of 1812.

By classes the pensioners on the roll June 30, 1930, were distributed as follows: Soldiers, 256,515; Army nurses, 473; widows, 199,704; minor children, 2,262; helpless children, 877; and dependent parents 4,426. The number of pensioners who died during the year was 35,792, of whom 11,082 were Civil War veterans and 18,353 Civil War widows. The total gains to the roll for the year numbered 23,541, and the losses 37,199, making a net loss of 13,658 for the year.

On June 30, 1929, there were 41,282 claims in the pending files. During the year 190,742 claims were received and 121,791 claims were disposed of, leaving 110,233 claims pending on June 30, 1930.

The marked increase in the number of claims received and pending was largely due to new and liberal pension legislation enacted by the Congress toward the close of the fiscal year. Of the claims disposed of during the year 21,210 were based on Civil War service; 70,317 on Spanish War service; 2,818 on Indian wars service; and 11,029 on disability or death due to military or naval service. Final action was taken upon 3,220 cases in which pension was granted by special acts of Congress; 7,541 claims for accrued pension due at date of death of pensioner; 5,148 for expenses of last sickness and burial of deceased pensioners; and 447, of deserted wives claiming one-half the pension being paid to their husbands.

Toward the close of the fiscal year the Congress passed two pieces of general pension legislation. On June 2, 1930, it granted pensions and increase of pensions to certain soldiers, sailors, and nurses of the War with Spain, the Philippine insurrection, and the China relief expedition. The rates of pension to soldiers, sailors, and marines of the Civil War, and widows and former widows of such soldiers, sailors, and marines were increased by an act approved by the President June 9, 1930.

The Pension Bureau is charged with the administration of the laws providing for retirement with annuity of civil-service employees. On June 30, 1930, there were 17,768 annuitants on the roll of whom 13,774 were retired for age and 3,994 for disability. During the year 1,973 of the claims for annuity based on age were disposed of, and 1,050 of the claims based on disability. Civil-service employees to the number of 25,700, who had severed their connection with the Government service, made application for refund of deductions from their salaries for the retirement fund, and the claims of 25,110 were settled. There were 1,434 annuitants dropped during the year by reason of death. The cost of administration of the retirement law was \$80,924.77, of which \$69,401.74 were expended for personal services.

On June 30, 1929, the balance in the civil-service retirement and disability fund was \$119,525,394.86. During the past year \$29,027,662.33 were added to the fund, representing 3½ per cent of the annual salaries of civil-service employees. The fund was further increased by the addition of \$5,899,257.42, interest and profits from investments, and \$20,500,000 appropriated from the general fund of the Treasury. There was disbursed from the fund in payment of annuities the sum of \$13,107,731.55 and on account of refunds \$5,049,107.36. The balance in the fund on June 30, 1930, was \$156,795,475.70.

On May 29, 1930, an act amending the act of July 3, 1926, providing for the retirement of civil-service employees, was approved by

the President. This act, which became effective July 1, 1930, reduces the age for superannuation retirement of certain groups of employees and provides for optional retirement two years earlier in all cases where the employee has rendered at least 30 years' service. A new method for computation of annuities is provided, which results in an increase of most of the annuities heretofore granted. Altogether the new retirement law is much more liberal in its provisions for aged and disabled civil-service employees than the act of July 3, 1926, which it practically supersedes.

OFFICE OF EDUCATION

SUMMARY OF THE COMMISSIONER'S REPORT

The Office of Education has no administrative functions except those connected with the expenditure of the funds appropriated by the Federal Government for the maintenance of colleges of agriculture and the mechanic arts in the several States and Territories, and those connected with the education, support, and medical relief of natives of Alaska. It is primarily an establishment for educational research and promotion.

During the fiscal year ended June 30, 1930, the survey of land-grant colleges, begun in July, 1927, was completed. This study, one of the most comprehensive ever undertaken in the field of higher education, was authorized by Congress 3 years ago, and an appropriation of \$117,000 was made to defray its cost. The report of the foregoing investigation is now in process of publication. The survey of State-supported higher institutions in Oregon is making satisfactory progress, and the findings will be presented to the State Board of Higher Education of Oregon during the Fall of 1930.

The survey of secondary education in the United States is progressing satisfactorily. It is planned to appoint this fall a committee of between 50 and 60 laymen representing all aspects of lay opinion and all States in the Union. Condensed reports of the progress of the survey will be sent to these persons and their criticisms received and considered.

The foregoing investigation as organized furnishes a model which, if satisfactory, will be followed in all other special studies of the Office of Education. By October 1, 1930, the survey will be operating with a staff as follows: 10 part-time professional experts stationed in the field, under whom will work some paid experts and some nonpaid student investigators; 8 full-time professional workers stationed in Washington; and 8 full-time clerical assistants stationed in Washington.

A nation-wide study of the professional education of teachers, authorized by Congress, is one of the forthcoming projects of the office. A fund of \$200,000 for the conduct of the survey was provided by Congress, and of this amount \$50,000 is available for expenditure during the present year. Dr. E. S. Evenden of Teachers College, Columbia University, was appointed as part-time associate director and expert in teacher education of the survey.

Conferences.

Acting under appointment of the Secretary of the Interior, the Commissioner of Education served as chairman of the advisory committee on education by radio. On January 1, 1930, the investigations of this committee were formally closed, and the Commissioner of Education wrote its summary report. The annual conference of State superintendents and commissioners was held December 9 and 10, 1929. Conferences on rural education were continued as heretofore. The commissioner also called, on December 6 and 7, 1929, a conference at Washington in the interest of better education in home making. As a result of the foregoing a regional conference was held at the University of Cincinnati on March 21, which was productive of splendid results.

Library.

A specialist in school libraries was added to the library division to devote full time to investigations of school library conditions, and another cataloguer was employed on account of the heavy increase in permanent material received in the library. The bibliography of research studies in education was issued as Bulletin, 1929, No. 36, and the bibliography for 1928-29, which will be issued as Bulletin, 1930, No. 23, was sent to the printer.

Publications.

The whole number of documents printed during the fiscal year was 72, of which 36 were bulletins, 12 pamphlets, 1 leaflet, 1 report of the Commissioner of Education, 10 numbers of *School Life*, and 12 miscellaneous publications. Of the bulletins issued, 7 were chapters for the Biennial Survey of Education.

The allotment of funds for printing was \$2,000 more than in 1929. The amount allotted was insufficient in that there were statistical and research manuscripts on hand, ready for the printer, for which the cost of printing was conservatively estimated at \$6,000 over and above the amount available for printing.

Alaska.

Through the Alaska division, the Office of Education maintains schools, furnishes medical relief, and provides assistance generally for the aboriginal races in the widely varying regions of Alaska. During the year the responsibility of the office in connection with the reindeer industry in that Territory was transferred to the governor on the recommendation of the Commissioner of Education, so that the Office of Education retains administrative authority only with respect to the education, support, and medical relief of the natives.

The amount granted by Congress for the education and support of the aboriginal races of Alaska for the fiscal year ended June 30, 1930, was \$580,000, and for their medical relief \$171,780.

In order that the headquarters of administrative authority should be located as near as possible to situations demanding attention, the office of the chief of the Alaska division was transferred from Seattle to Juneau, the purchasing of supplies, the making of arrangements for the transportation of appointees and of supplies, and the operation of the U. S. S. *Boxer*, remaining as duties to be performed by the purchasing agent and office manager in Seattle.

During the fiscal year, the Office of Education maintained in Alaska 93 schools with 195 teachers, an enrollment of 3,899, and an average attendance of 3,029. The expense of conducting the three industrial schools during the year, including the expenditures for salaries, supplies, and the construction and repair of buildings, was as follows: For Eklutna, \$63,522.81; for Kanakanak, \$43,702.87; and for White Mountain, \$43,132.11. Preliminary steps have been taken toward the establishment of an industrial boarding school for the natives of southeastern Alaska, on a tract on Shoemaker Bay, 4 miles south of the town of Wrangell.

Provision has been made for opening during the next school year of day schools at Akiajak, on the Kuskokwim River; at Nondalton, 20 miles from Iliamna Lake; and at Tuliksak, on the Kuskokwim River.

To provide a home for orphans and other young children of pre-school and early school age, an orphanage has been established in one of the former Fort Gibbon buildings at Tanana, which have been transferred to the Office of Education. To this institution will be taken homeless children of preschool and early school age who have hitherto of necessity been cared for in the industrial boarding schools at Kanakanak, Eklutna, and White Mountain.

School finance.

At the Atlantic City meeting in February, 1930, the National Association of State Superintendents and Commissioners of Education requested a study of school finances. The Commissioner of Education, in consideration of this plea, urges a study at a cost not to exceed \$350,000 to extend over a period of four years and recommends that \$50,000 be appropriated for the next fiscal year. Should this study be authorized the money appropriated for special fields of research in education would be slightly in excess of \$200,000 in the fiscal year 1931-32. This is approximately 20 per cent of what has been urged for research in certain bills presented to Congress.

The reorganization of the Office of Education has been completed. The division of research and investigation, headed by the assistant commissioner, was created to consolidate and coordinate the efforts of the research divisions. A new division of special problems was created to study intensively special problems involved in the education of the Negro; atypical and handicapped children, etc.

A former section on foreign education was raised to the status of a division, and the commissioner recommends that at least two specialists should be added to the foregoing division in the near future—one, an expert in comparative education, European; the other, an expert in comparative education, oriental.

All administrative responsibilities of the Office of Education, including the administration of schools and medical relief in Alaska, are handled through the chief clerk. Since the last report of the commissioner the administration of the reindeer service has been assumed by the Governor of Alaska. At present District Superintendent Hawkesworth is acting chief of the Alaska division, with headquarters at Juneau. The Commissioner of Education expresses hope that the next Territorial legislature will establish a Territorial board of education with power to select a commissioner and also a Territorial board of health. "If these two steps," he says in his report, "can be taken along lines already well established in some of the States it should be possible to effect a unified school system in Alaska in place of the present dual system and to consolidate the health work. Such action should provide present service at less expense or better service for the present outlay." The commissioner plans to hold conferences at Juneau in the spring of 1931 in the interest of the foregoing policies.

The creation of a division of major surveys represents the chief new addition to the work of the old Bureau of Education. It will be the policy of the Office of Education, in the future, to undertake major researches in education on special appropriations and by experts brought in for temporary service. "All part-time workers," says the commissioner, "should be sent back to their respective former posts after the study on which they have been engaged has been completed and full-time workers should be expected to find new places."

The above policy will enable the Commissioner of Education to secure the part-time services of experts whose salaries at their respective school and college posts would not permit them to accept the salaries paid by the United States Government. This policy will redound to the advantage not only of the institutions regularly employing these experts, but through them it will reach a group of younger men and women who study in their seminars.

Efforts to coordinate educational research work of the Office of Education have been made in the appointment of (1) an advisory committee to counsel with the library of the office on a bibliography of educational studies made in partial fulfillment of the requirements for the doctor's and master's degree at the various colleges and universities; (2) an advisory committee on State histories of education; (3) a national advisory council on school building problems; (4) a national committee on cooperative research.

GEOLOGICAL SURVEY

SUMMARY OF THE DIRECTOR'S REPORT

Geologic work was done in 30 States, Hawaii, and Alaska, in part in cooperation with the States, with other Government agencies, and with nongovernmental scientific associations.

The fourth year of the potash investigations under the act of 1926 was completed. During the year special attention has been paid to the petrographic study of well cuttings to detect the presence of the more desirable potash minerals. This work, which involved thousands of determinations, has aided in the selection of five sites—three in New Mexico and two in Texas—recommended to the Bureau of Mines for drilling. Beds of potash salts were found in three of the Government tests.

The work on metalliferous deposits in Colorado in cooperation with the State geological survey and the metal mining board was continued on an expanding scale. One of the districts studied contains the largest molybdenum mine in the world.

The cumulative results of several years' work in Idaho are clarifying the hitherto obscure geologic features of one of the least-known regions in the Western States.

A resurvey of the Tonopah district, Nevada, where developments in the 25 years since the Geological Survey's early report on the district have thrown much new light on the complicated geologic problems, was begun, and a preliminary report was completed for publication by the State, which is cooperating in the work.

The work done in cooperation with the Oregon State Mining Board has been continued with greatly increased scope, several mining districts being examined during the year.

Investigations were made of coal areas in Colorado, Montana, New Mexico, and Utah.

Field work was begun in Georgia to obtain information needed in the preparation of a geologic map of the State.

The manuscript for a geologic map of Pennsylvania, to be published by the State, was completed, and work on the geologic map of Texas and the revised geologic map of Virginia was continued.

A detailed study of the geologic history of the lower Mississippi River was begun, to obtain information that may be of service in any broad plan for river rectification or control.

The geology of dam and reservoir sites in several States was studied, partly in cooperation with local and Federal agencies.

A geologic reconnaissance of the island of Hawaii was made, and geologic mapping was begun in the Kona district.

Geologic advice was given to the Indian Service concerning the adequacy of bids at a sale of Osage leases in Oklahoma.

Nearly 10,000 samples were examined, analyzed, or otherwise tested in the chemical laboratory.

Laboratory studies of oil sands have led to improvements in oil recovery in some fields.

Aerial photographic work in southeastern Alaska was continued by a special unit of the Navy Department, to which a Geological Survey engineer was attached. This unit photographed about 12,000 square miles of difficult country and delivered the resulting films to the Geological Survey for cartographic use. The successful accomplishment of this work affords further demonstration of the great value of the airplane as a means of transportation in a region that is almost untraversable by any other means. Nearly 50,000 separate prints were made from the films, one-half of them for the Forest Service. Many other steps remain before the results of this work can appear on finished maps.

Reconnaissance geologic explorations were made in the Copper River, Lake Clark-Mulchatna, and Yukon-Tanana regions of Alaska. Among the new projects started near the end of the year was an investigation of the mineral resources of the country near the Alaska Railroad, with the object of assisting the mining industry of the Territory to take full advantage of the transportation facilities afforded by the railroad.

The topographic surveys made during the year covered more than 22,000 square miles and increased the area mapped in the continental United States, exclusive of Alaska, to 44.2 per cent. In this work 25 States, 3 counties, and Hawaii cooperated. Some of the work in Washington and Hawaii was done by aerial photography.

Measurements of stream flow were made in 47 States and Hawaii, and the number of gaging stations was increased from 2,238 to 2,426. Investigations relating to ground water and power or reservoir sites were made in 26 States and Hawaii. In the work on water resources 34 States and Hawaii cooperated.

The classification of public lands was continued in 20 States and Alaska. The results accomplished include net decreases of 60,287 acres in the area of outstanding mineral withdrawals and of 7,583,110 acres in enlarged-homestead designations and net increases of 108,295 acres in power reserves, 1,279,429 acres in stock-raising homestead designations, and 11,392 acres in public water reserves. The supervisory work on public lands subject to the mineral-leasing

laws was continued, and the royalties, rents, and bonuses accrued from mineral operations on such lands amounted to \$6,273,151. Inspection, regulatory, and advisory service was rendered in connection with the leasing of mineral deposits on Indian lands in eight States.

The outstanding publication of the year was a monograph on the titanotheres of ancient Wyoming, Dakota, and Nebraska, a monumental work of nearly 1,000 pages that is the culmination of investigations begun about 50 years ago. The results of these investigations have transformed our knowledge of the early Tertiary geology of the Rocky Mountain basin region and afforded a unique opportunity to acquire new information as to the modes of evolution and the causes of both evolution and extinction.

Other notable publications include an elaborate geographic, geologic, and hydrologic report on the Mohave Desert region of California, detailed reports on the upper Colorado River and the Green River and their utilization, 10 of the series of land-classification maps of the Great Plains, and several more of the large-scale maps of Chicago and vicinity and Los Angeles County, Calif.

THE BUREAU OF RECLAMATION

SUMMARY OF THE COMMISSIONER'S REPORT

The area irrigated in 1929 with water from Government works was 2,718,130 acres, an increase of 41,030 acres over that of 1928.

The area cropped was 2,705,240 acres, an increase of 23,970 acres.

The total value of crops was \$161,179,880, an increase of \$17,608,810 compared with 1928. This is 80 per cent of the total construction expenditure on works which provide the water.

Since water was first available in 1906, the cumulative value of crops grown on land irrigated from Government works amounted to \$1,642,267,680.

Owing to the default of one project in the payment of the annual installment of construction charges and small increases in delinquencies on other projects, the financial results of operations during the fiscal year were not as good as for previous fiscal years. Payments from a majority of the projects were better than in any previous year.

Construction payments in the fiscal year 1930 were \$3,231,522.07, a decrease of \$1,156,281.73 compared with the previous year.

Payments for operation and maintenance were \$1,651,096.76, or \$269,403.81 less than in the previous year.

Total payments amounted to \$4,882,628.83 compared with \$6,308,314.37 in 1929, a decrease of \$1,425,685.54.

Income to the bureau from all sources during the fiscal year was \$9,035,508.35, or \$815,930.27 less than in the previous year.

The operation expense for the year was \$1,786,198.65, a decrease from the previous year of \$730.16.

Excess of operation and maintenance expense over receipts for the period amounted to \$135,101.89, compared with an excess of receipts over expense of \$133,571.76 for the previous year.

The amount available for construction was \$11,785,000.

The amount expended on construction was \$8,611,400, compared with \$7,898,300 the previous year.

Works now under construction under the 10-year program involve an ultimate expenditure of about \$80,000,000. This provides for the completion of old projects and the construction of new projects under the reclamation act authorized by Congress. The Boulder

Canyon project is being constructed with funds and under authority separate from the reclamation act.

The bureau has expended for surveys and investigations, construction, operation and maintenance, and incidental operations, \$250,635,000, distributed approximately as follows:

Surveys and investigations not allocated to primary projects----	\$3, 200, 000
Construction of irrigation works, etc-----	203, 300, 000
Operation and maintenance-----	32, 500, 000
Incidental operations, plant and equipment, etc-----	11, 635, 000
	<hr/> 250, 635,000

As the settlers refund to the Government the cost of construction and operation, the fund is replenished and money becomes available for the construction of new projects. Regular repayments are being made to the Government by 22 projects, and only 2 completed projects have not yet reached a repayment status. Accretions to the revolving fund come from the sale of public lands, the receipts from which source last year amounted to \$690,563.36, and from royalties from oil leases, which last year added \$2,315,509.77 to the fund.

Of the money that has been made available for Federal reclamation work, more than 50 per cent has come from repayments by the water users and collections from other sources. As a result of this revolving feature of the fund, approximately one-third of the work performed by the bureau has been made possible by reason of such repayments. In other words, the bureau has had 50 per cent more money to carry on its operations than would have been available if the revolving feature had not been in effect. During the past six fiscal years and in the future the amounts available for expenditure have been and will be more and more dependent upon the revolving feature of the fund, owing to the decrease in accretions from the sale of public land and from royalties from oil leases.

There were on the projects 39,970 irrigated farms, with a population of 157,088; 214 cities and towns, with a population of 473,073; 686 schools, 713 churches, and 130 banks, with deposits of \$145,-386,400 and 245,181 project and nonproject depositors.

The approval on July 3, 1930, of the second deficiency act, containing an appropriation of \$10,660,000 for commencing construction of the Boulder Canyon project, although occurring subsequent to the close of the fiscal year covered by this report, was of such significance that it should be commented upon. It was the culmination of many years of constructive planning, of thorough investigation by numerous individuals and specially constituted boards of engineers and economists, and of an intensive educational campaign on the part of those interested in the progress of the Southwest through the development of the Colorado River Basin.

A little more than a year previous, on June 25, 1929, President Hoover had issued a proclamation making effective the Boulder Canyon project act. This was followed by numerous conferences with representatives of the various States, municipalities, and power companies interested in contracts for the sale of power, which, under the law, had to be signed before an appropriation would be made by Congress to begin construction. As a result of these negotiations, contracts for the lease of the power privilege were signed by the United States and the city of Los Angeles and the Southern California Edison Co. The city and company will operate and maintain the power plant and furnish energy to meet the requirements of allottees, as follows: Arizona, 18 per cent; Nevada, 18 per cent; metropolitan water district, 36 per cent; Southern California municipalities, 6 per cent; Los Angeles, 13 per cent; Southern California Edison Co., 9 per cent. These allocations are percentages of firm energy of 4,240,000,000 kilowatt-hours per year upon completion of the dam and power plant. An additional 90,000,000 kilowatt-hours will be available to various municipalities. Secondary energy is allocated to the metropolitan water district, with a privilege in the city and company to use equally any secondary energy not in use by the district for the time being. Rates of payment for energy have been fixed at 1.63 mills per kilowatt-hour for firm energy and one-half mill per kilowatt-hour for secondary energy.

The initial appropriation of \$10,660,000 will be used in the construction of a railroad from Las Vegas, Nev., to the dam site, the building of a construction road, the laying out of a town site and waterworks, and following these, the commencement of construction of the cofferdams above and below the site of the dam and the four diversion tunnels, each 50 feet in diameter.

The Colorado River board of engineers and geologists, headed by Maj. Gen. William L. Sibert, recommended increasing the height of the dam by 25 feet, or to a maximum height of 707 feet, as a flood-control measure. This will result in raising the river surface 582 feet and increasing the reservoir capacity to 30,500,000 acre-feet. The board emphasized the fact that its approval of the increase in height of the proposed dam was based solely on the desirability of more effective flood control, and that the development of power should never be a factor in the control of the flood-storage space in the reservoir.

During the fiscal year 1930 three important dams were completed, namely, Gibson storage dam on the Sun River project, Montana; Easton diversion dam on the Kittitas division of the Yakima project, Washington; and Harper diversion dam on the Vale project, Oregon.

Three large storage dams were under construction: Owyhee Dam on the Owyhee project, Oregon-Idaho; Echo Dam on the Salt Lake Basin project, Utah; and Deadwood Dam on the Payette division of the Boise project, Idaho.

Preliminary investigations were made looking to the construction of Cle Elum Dam on the Yakima project, Washington, an initial appropriation for which is available for the fiscal year 1931.

Important canal and lateral construction was in progress on a number of projects and drainage work was continued on several others.

The total length of canals, ditches, and drains constructed to the end of the fiscal year amounted to 16,990 miles. Tunnels numbered 124, with a total length of 331½ miles. Canal structures numbered 161,469; bridges, 11,864, with a total length of 531½ miles; and culverts, 14,675, with a total length of 107½ miles. Concrete, metal, terra cotta, and wood pipe laid to the end of the fiscal year amounted to 4,279,249 linear feet, and there had been constructed 5,260 concrete, metal, and wood flumes 165 miles in length. Telephone lines totaled 4,010 miles and transmission lines, 3,204 miles. Water and steam power developed amounted to 189,348 horsepower. Excavation during the fiscal year amounted to 15,283,359 cubic yards, bringing the total excavation to the end of the year to 292,105,859 cubic yards. Riprap totaled 2,565,250 cubic yards; paving, 1,968,869 square yards; and concrete placed, 4,391,996 cubic yards.

During the summer of 1929 an economic survey was made of certain Federal and private irrigation projects, representing about 16 per cent of the total irrigable area of the projects receiving water from the works of the bureau and including projects whose settlement and development had been unduly prolonged or which were seeking relief from the Government for one reason or another.

A specially constituted board submitted its report, based on the reports of field investigations, to the Secretary of the Interior, early in 1930. The board discussed and made recommendations concerning a general Federal reclamation policy, the most important features of which are State participation in the financing and settlement of future projects; the establishment of a source of credit to meet the needs of settlers of small means in the early years of development; the assessment of project charges on an ad valorem basis or the nearest practicable approach to this basis; and assistance to private projects, already partially developed but in financial difficulties. The board also discussed the problems of the individual projects investigated and made appropriate recommendations concerning each.

In 1926 the Secretary of the Interior, with the approval of President Coolidge, made an important change of policy in the manage-

ment of reclamation works. This was to transfer the management of these works to the water users supplied from them as soon as satisfactory purchase contracts were signed. Up to that time the policy was for the bureau to continue operation indefinitely, only two projects having been turned over to local operation and control. These were the Salt River project and the Gravity division of the Minidoka project.

The policy of decentralization and local control has been approved by President Hoover and Congress. The greater part of the completed works are either being operated by the people who are served by them or they will be so operated at a definite and early date, as will be seen from the following table:

PROJECTS TURNED OVER TO WATER USERS' ORGANIZATIONS FOR OPERATION AND MAINTENANCE

Project	Year	Remarks
Salt River project, Arizona.....	1917	Association operating entire project.
Boise project, Idaho.....	1926	United States operating reserved works; board of control operating transferred works.
King Hill project, Idaho.....	1926	District operating entire project.
Minidoka project, Idaho:		
Gravity division.....	1917	United States operating reserved works.
South-side pumping division.....	1926	Do.
Huntley project, Montana.....	1927	District operating entire project.
Sun River project, Montana, Fort Shaw division.	1926	United States operating reserved works.
North Platte project, Nebraska-Wyoming:		
Interstate division.....	1926	Do.
Northport division.....	1927	Do.
Fort Laramie division.....	1927	Do.
Newlands project, Nevada.....	1927	District operating entire project.
Umatilla project, Oregon.....	1926	District operating entire project, except McKay Reservoir.
Strawberry Valley project, Utah.....	1927	Association operating entire project.
Okanogan project, Washington.....	1929	District operating entire project.
Shoshone project, Wyoming:		
Garland division.....	1927	United States operating reserved works.
Frannie division.....	1930	Do.
Grand Valley project, Colorado.....	1932 and 1937	} Contract pending.
Uncompahgre project, Colorado.....	1932 and 1937	
Milk River project, Montana.....	1936	Certain works to be reserved.
Sun River project, Montana, Greenfields division.	1931	Contract executed.
Lower Yellowstone project, Montana.....	1932	Contracts executed. Entire project will be transferred.
Vale project, Oregon.....		Project will be transferred upon completion of construction.
Owyhee project, Oregon-Idaho.....		Do.
Belle Fourche project, South Dakota.....	1934	Contracts executed. Entire project will be transferred.
Salt Lake Basin project, Utah, first division.....		Project will be transferred upon completion of construction.
Yakima project, Washington, Kittitas division..	1931	Contract executed.

The results have been satisfactory. The policy has given irrigators a better understanding of their canals and water supply and has been an invaluable training in organization, cooperation, and business management. The water users have an interest in their projects and a pride in possession and management which does not exist while they are operated by the bureau. Experience leads to

the conclusion that the policy should be continued and should include all projects.

The Government still operates the Rio Grande, Carlsbad, Yuma, Orland, and Klamath projects. The irrigators under them understand conditions and are competent to maintain and operate them. Their boards of management are well organized. To leave control of the projects with the bureau means duplication of ideas and efforts. The time for local control seems to have arrived.

THE NATIONAL PARK SERVICE

SUMMARY OF DIRECTOR'S REPORT

Again travel to the national parks broke all records, despite the decrease in long-distance rail travel and resort use throughout the country generally. In all, 2,774,561 people used the national parks, an increase of 93,964, or 3.5 per cent, over 1929. The national monuments did not fare so well, reporting a decrease from 567,667 to 472,095 visitors. Part of this decrease was due to the abolishment of the Papago Saguaro National Monument, which last year was visited by 87,600 people. Approximately 50,000 people visited this area up to the time of change in status.

Changes in park and monument system.

Several changes took place in the national park and monument system. The Carlsbad Cave, formerly a national monument, was given park status by the act of May 14, 1930, under the name of the Carlsbad Caverns National Park. This act also authorized the enlargement of the park by presidential proclamation, upon recommendation of the Secretary of the Interior, up to a total of 193 square miles additional. An investigation will be made to determine how great a proportion of these lands should be added to provide adequate surface protection to the caves which extend for miles underground, and also possibly to take in caves not yet explored.

The area of Zion National Park was enlarged to a total of 148.26 square miles through the addition of an area of unusual scenic value, needed also for reasons of practical administration. Rocky Mountain National Park was increased to an area of 400.52 square miles, for both scenic and administrative reasons. The addition of 7,725 acres to Yosemite National Park is referred to elsewhere. The Acadia National Park was extended by the addition of 229 acres of Government lands and 412 acres donated from private sources, bringing its total area to 16.72 square miles. It is understood that further additions will be tendered to the Government in the near future.

The George Washington Birthplace National Monument, at Wakefield, Va., was established by act of Congress approved January 23, 1930. Additional lands to bring the area up to approximately 365 acres will be transferred to the Government through the Wakefield

National Memorial Association and Mr. John D. Rockefeller, jr. It is planned to erect here, on the site of the old home, a house of the period, and similar to that in which George Washington was born. This work is being pushed so that it may be completed before the celebration of the bicentennial of the birth of our first President in 1932.

The Craters of the Moon National Monument was enlarged by the addition of 37 acres. The Papago Saguaro National Monument was abolished by act of Congress and the land diverted to various State and local uses for which it was considered more suited.

Proposed boundary adjustments.

A number of boundary adjustments were under consideration. The Yellowstone Boundary Commission, appointed by President Hoover under congressional authority, finished its work and made report to the President upon the changes suggested for the southeast and southwest portions of the boundary of Yellowstone National Park. The details of this report have not yet been made public.

The most important immediate boundary adjustment problem is that of extending the east boundary of Mount Rainier National Park to include a portion of the summit of the Cascade Range. This would include in the park Chinook Pass, which topographically is its natural eastern gateway. The proposed adjustment would include in the park some superb scenic areas, and would also facilitate administration, protection, and development of the region.

Study was given to the Kings River country of California, long proposed by conservationists for addition to Sequoia National Park. The United States Forest Service and the National Park Service have agreed as to the area which should be given park status, either as an extension of Sequoia Park or a separate park, according to the expressed wishes of the local people. Should a separate Kings Canyon National Park be established, the present General Grant Park, an area of 4 square miles, would be included in it. The Federal Power Commission, the Sierra Club of California, and members of the advisory board on educational problems in the national parks examined the area. The Director of the National Park Service again visited the Kings River country and reiterates his belief that the best interests of the country would be served by giving this area national-park status. He stresses the point that the preservation of this great mountain area would be of inestimable value to the local ranchers through protection of the watersheds of mountain streams and resultant conservation of the local water supply.

Additions to both the north and south rims of the Grand Canyon National Park have been proposed in the best interests of preservation of the native wild life, both flora and fauna. Studies were

made during the year and conferences held with officials of the Forest Service as to the area that should be added. A project is also pending for the enlargement of Bryce Canyon National Park to include an area of scenic and scientific interest. Already congressional authority exists for the extension of the park by presidential proclamation upon the recommendation of the Secretaries of Agriculture and Interior.

Eastern park and monument projects.

Interesting progress has been made toward consummating the three eastern park projects for which Congress has already granted authority. Deeds to 158,876.50 acres of land in the Great Smoky Mountains National Park region were accepted on August 28, 1930. The area then assumed limited park status, under the clause in the organic act providing that when 150,000 acres or more had been donated to and accepted by the Secretary of the Interior administration and protection could be undertaken. Accordingly a protective force has been installed, and it is planned to transfer a trained park superintendent to the new park within the next few months. Until a total of 427,000 acres, specified by Congress as the minimum area for full park status, has been deeded to and accepted by the Government, development of the park for tourist travel may not be undertaken. The greater part of the remaining area has been acquired or is under condemnation by the State commissions engaged in the acquisition of lands for the Great Smoky Mountains National Park, and it is hoped that within a short time it will be available for full park development.

Minimum boundary lines of the Shenandoah Park project were definitely established on the ground. This enabled officials of the State of Virginia to make appraisals to determine the exact cost of acquiring the lands necessary for park purposes.

Private and State subscriptions and appropriations have provided the funds necessary to purchase the lands for the proposed Mammoth Cave National Park. Already some of the area has been acquired and steps are now being taken to secure the remainder, for transfer to the United States.

In conformity with the expressed direction of Congress, a study was made by a committee of national-park experts of the Everglades in the Cape Sable region of Florida, to determine the advisability and practicability of establishing a national park in that region. Upon recommendation of this committee a report will be submitted to Congress stating that this area measures up to the standards prescribed for national-park status and recommending its establishment. It is believed that the prospective educational value of the

area equals that of any existing national park and that the lands proposed for park status should be preserved in order to protect the primitive character of the country and its abounding wild life.

Establishment of the Colonial National Monument, to take in portions of Jamestown Island, Williamsburg, and Yorktown, was authorized by Congress upon certain conditions and a survey of the region directed. Mapping is now in progress in cooperation with the United States Geological Survey and the National and State Yorktown Sesquicentennial Commissions, as a preliminary measure to laying out the proposed boundaries. It is hoped that estimates of the cost of securing the necessary lands may be available when Congress convenes. The historical background of the area affords splendid possibilities for telling an interesting story with both a beginning and an end, one to stir the popular imagination and leave an indelible impression on every patriotic mind.

Inspections of park and monument projects expedited.

In order that the various park and monument projects presented to the National Park Service might have full consideration, Congress last year granted authority to employ specialists and experts to investigate and examine lands proposed for park and monument purposes. This will greatly expedite service inspection of such areas. Several investigations of proposed projects were made during the summer. After careful study of the Wallowa region in north-eastern Oregon by experts of the National Park Service, an adverse report was made upon the proposal. The region was found lacking in any outstanding feature that would entitle it to national-park status. The Park Service experts recognized its attractions, however, and expressed the opinion that it afforded excellent possibilities for State park development.

Projects of outstanding interest.

Two projects which should receive favorable consideration are those involving the preservation of unusually interesting prehistoric Indian ruins in the Bandelier (N. Mex.) and Canyon de Chelly (Ariz.) regions. Both these areas should be added to the national-park system in the near future, in order that adequate protection may be given them. The former, a monument project, was studied during the summer by a member of the advisory board on educational problems in the national parks. A bill for the latter project satisfactory to the Indian Service has been drawn up and is ready for submission at the next session of Congress.

Recognizing the possibilities of development of the area in the vicinity of the Hoover Dam, approximately 4,212 square miles in Arizona and Nevada were temporarily withdrawn from settlement.

The lake to be formed by the raising of the Colorado River, to be approximately 110 miles long, will extend about 40 miles into the Grand Canyon, making accessible by boat a superb scenic region now inaccessible to the average traveler. The possibilities of the entire area will be examined from the standpoint of future development and use.

A considerable area in the Death Valley region has also been withdrawn to enable the National Park Service to determine the advisability of giving a portion of it national-monument status.

Elimination of private holdings.

Excellent progress was made in the elimination of private holdings in national parks. The outstanding transaction in this line was the Yosemite purchase, in which 15,570 acres of magnificent sugar pine land were involved at a total cost of approximately \$3,300,000. Half the purchase price was contributed by John D. Rockefeller, jr. The remainder was expended from the fund provided by Congress for the acquisition of private holdings in national parks. Part of these lands, 7,725 acres in extent, lay outside the park boundaries. This area was added to the park by presidential proclamation dated April 14, 1930, as provided by legislation enacted last year.

Negotiations for the transfer to the Government of several other tracts in Yosemite National Park are now in progress, and steps are being taken toward eliminating privately owned lands in Glacier National Park. Small areas in Lassen Volcanic and Acadia National Parks have already been acquired. Negotiations to acquire the privately owned lands in the Petrified Forest National Monument are also in progress. Half the total area of that monument now is covered by railroad grants occupying alternate sections. The owners of this land have signified their willingness to exchange them for other nearby Government lands.

To further expedite the elimination of private holdings, an appropriation of \$1,750,000 was carried in the 1931 Interior Department appropriation act for the acquisition of privately owned lands and standing timber in the national parks and monuments, this fund to be available until expended.

Education and research.

The establishment of a branch of education and research in the Washington office of the National Park Service, with the appointment of Dr. Harold C. Bryant as chief, was the most important single achievement in this field. Coordination of all educational opportunities in the national parks and national monuments will follow.

The committee on educational problems in the national parks, whose recommendation resulted in the establishment of the new branch of education, made further field studies during the year.

Museum expansion and development continued throughout the system. Two branch museums were erected in the Yellowstone under the grant of \$118,000 secured two years ago by the American Association of Museums from the Laura Spelman Rockefeller Memorial. The installation of exhibits at the Yavapai Observation Station and Museum at the Grand Canyon was completed through the cooperation of Dr. John C. Merriam, president of the Carnegie Institution of Washington. Through the Gila Pueblo of the Medallion of Pasadena funds were offered for a museum at Lipan Point in the Grand Canyon Park and plans drawn. Plans were drawn for the Sinnott Memorial, to be erected at Crater Lake National Park in memory of the late Representative Nicholas J. Sinnott, of Oregon, under congressional authorization. The important archeological museum at Mesa Verde was extended. The Indian museum at Acadia National Park, erected on private ground, was deeded to the Government. Other park museums were improved and plans made for extensions or for new buildings in several of the parks and monuments. An excellent private collection has been offered to the United States for display at the Pinnacles National Monument when a suitable museum building shall have been provided. Popular interest in the various museum collections demonstrated the importance of this phase of educational development.

The guided nature trips and lectures continued to meet with great popular favor. The auto caravan, long in use at Mesa Verde National Park for conducting private motorists to the ruins, was adopted in Yosemite, Yellowstone, Sequoia, and Grand Canyon National Parks. Through this service ranger naturalists conducted visitors in their own automobiles to points of interest. The construction and use of nature trails continued to increase, and exhibits in place were marked and made accessible.

Archeological studies were made in Mesa Verde National Park and in a number of the southwestern national monuments. In the Mesa Verde and also at the Grand Canyon expeditions from the Gila Pueblo were engaged in making extensive records of all ancient dwelling sites. Through these surveys, which will cover a large part of the Southwest, it is believed it may be possible to trace the origin and spread of prehistoric Indian cultures.

Through the tree-ring chronology established by Dr. A. E. Douglass, it was possible, by study of beam cores from the cliff-house structures in the Mesa Verde, to determine the age of these ancient dwellings. Other important studies were made by scientific organ-

izations and individuals and by other Federal bureaus in cooperation with the National Park Service.

Wild-animal conditions.

Outstanding in the field of wild-animal protection is the 2-year survey of park life undertaken by George Wright and Joseph Dixon, park naturalist aids. Funds for this survey were contributed by Mr. Wright. It is hoped through these investigations to solve some of the most urgent problems at present affecting the park wild life.

Elk studies were also continued by William Rush of the Forest Service under a cooperative arrangement between the National Park Service and the Forest Service, the Bureau of Biological Survey, and the Montana Fish and Game Commission. This survey was initiated through contributions from Thomas Cochran of New York City.

Although the park animals generally came through the year in excellent condition, grave fears are felt for their safety during the coming winter. The severe drought has so affected forage conditions on the winter range of the elk and deer that the outlook is extremely unfavorable, with the possibility of an unusually severe winter bringing disaster. Large sums of money may have to be secured to purchase sufficient hay to enable the herds successfully to pass through the winter.

An interesting and important problem facing national-park officials is that of the bears, which, due to feeding by tourists, have become too fearless and aggressive. A survey of this entire situation will soon be made to determine the best method of handling the problem.

Forest protection.

Increased vigilance in protecting the park forests was made possible during the past year through the appropriation of \$96,850 for the control and prevention of insect infestations, tree diseases, and forest fires. This made possible the adoption of preparedness programs to hold fire and other depredations down to a minimum.

This work is important not only in connection with the preservation of the beauty of the national parks, but also from the standpoint of neighboring communities. By preserving the park trees which often form the main watersheds of the region, the water supply of near-by farmers and ranchers is conserved.

Appropriations and revenues.

Appropriations for the national parks and monuments for the fiscal year 1930 totaled \$7,813,817.18, with additional authority to enter into contracts for road work up to \$2,500,000. Cash donations to the national parks for the fiscal year ended June 30, 1930,

amounted to \$1,781,453.05. These funds were deposited in the United States Treasury and expended under the fiscal regulations governing all expenditure of Federal funds.

Revenues for the 1930 fiscal year amounted to \$1,015,740.56, reaching the million-dollar mark for the first time in park history. This despite the reduction in automobile entrance fees in 1927 and the economic depression of the past year.

Park road development.

Major road construction in the national parks is being pushed as rapidly as available funds and contractual authority will permit, in cooperation with the Bureau of Public Roads of the Department of Agriculture. Some of the parks are located within areas where unemployment has been most prevalent, and it was possible during the 1930 working season to relieve this situation somewhat by advancing calls for proposals and accelerating road contract placements. With unusually favorable operating conditions prevailing throughout the summer, the expenditure of a larger sum of money than was available would have been productive of unusually effective results.

One of the biggest things of the year, from a national-park standpoint, was the putting into use of spectacular new roads. For the first time the excellent results of careful landscape planning of highways was apparent to park visitors generally. Such roads as the Zion-Mount Carmel, the Cape Royal in Grand Canyon, the Paradise Valley and Yakima Park in Mount Rainier, the Sylvan Pass in Yellowstone, and the west-side portion of the Transmountain Road in Glacier, all are outstanding examples of the importance of such landscaping. The elimination of dust from the park highways through oiling was accomplished in Sequoia, General Grant, Yosemite, Crater Lake, Mount Rainier, Glacier, Yellowstone, Zion, and Grand Canyon National Parks. Oiling was also extended to the principal trails in the major parks.

In connection with park road work consideration should be given to speeding up construction on approach roads whose primary value is to carry national-park travel. From a strictly business standpoint, and with a view to a balanced national road program, it would appear essential to provide for financing the construction of the necessary approach roads to permit maximum use of the national parks.

Public-utility service.

A conference of officials of the public utilities operating in the various national parks was held in Washington last year. At that time department officers laid stress upon the need for comparative uniformity in the type of accommodations furnished and the prices

charged throughout the system. The necessity of the operators' submitting to the Government plans of operation and expansion covering a 5-year period was also emphasized, in order that the National Park Service and the operators, working together, may provide the public with the best possible facilities for enjoying the parks. Submission of such a program is important in connection with the preparation of the Government budget for development work.

Most of the operators complied with the request and submitted comprehensive improvement programs. The first year's program was carried out in part, but financial conditions made certain curtailments necessary.

From personal observation of various department officers, the tourist facilities at the North Rim of the Grand Canyon, installed by the Utah Parks Co., constituted the best all-round development in the national park system from the standpoint of variety of service made available to the public, type of architecture employed, and other considerations.

THE TERRITORIES

THE TERRITORY OF ALASKA

SUMMARY OF THE GOVERNOR'S REPORT

The Governor of Alaska, Hon. George A. Parks, in his report for the fiscal year ended June 30, 1930, shows that the industrial conditions in the Territory are satisfactory; that there has been an increase in the mineral production, an increase in population, and a balance of trade in favor of the Territory.

Economic conditions.

During the first nine months of the year labor was well employed in nearly every section of the Territory, but during the early summer a surplus of laborers was reported in a few places, notably in southeastern Alaska. This surplus was attributed to the influx of unemployed from the Pacific coast section of the United States, and was believed to have been absorbed by the fisheries and mines before the middle of the summer. No widespread epidemics of any kind occurred.

Population.

The Fifteenth Decennial Census, though not completed, shows approximately 4,500 more people were enumerated in the Territory than in 1920. An analysis of the data will be necessary before it will be possible to classify the increase according to races and occupations. This increase, though small, indicates that the decline that was apparent for many years has ceased and the population of the Territory is again on the increase. Most of the larger communities show a gain. Fairbanks has the greatest growth, with Ketchikan, Nome, Petersburg, Juneau, and Anchorage, following in the order named.

Territorial finances.

The balance in the Territorial treasury at the close of business June 30, 1930, was \$968,947.99. The combined resources of the Territorial and national banks on the same date were: Capital, \$915,000; surplus and net undivided profits, \$935,300; deposits, \$12,252,300 as compared with: Capital, \$915,000; surplus and net undivided profits, \$815,100; deposits, \$12,754,500 for the previous year. The

total assessed valuation of incorporated towns for 1930 was \$25,-512,663, as compared with \$23,444,571 for 1929.

Exports and imports.

The report of the collector of customs for the fiscal year 1930 discloses a decrease in the total value of shipments to the United States as compared with the year 1929, but the decrease is accounted for by the decline in the output of the salmon fisheries.

The total value of the exports and imports for the fiscal year ended June 30, 1930, is \$101,084,190 as compared with \$107,831,665 for 1929. The exports were valued at \$68,999,456 and the imports at \$32,084,734 as compared with \$76,038,452 and \$31,793,213 for the previous year.

Mining.

The total gold production from all sources is estimated to be \$7,761,000 as compared to \$6,845,000 in 1928 and of this amount \$3,644,000, or approximately 47 per cent, was derived from the lode mines; the amount secured from the placers being \$4,117,000. Approximately 95 per cent of the lode gold production comes from mines in southeastern Alaska, the largest being that of the Alaska Juneau Gold Mining Co. at Juneau. The largest yield of placer gold came from the Yukon-Tanana region and from the Seward Peninsula. Mining of copper ores on a commercial basis was confined to two districts, Latouche Island in Prince William Sound and Kennecott in the Copper River district. In 1929, 590,400 tons of copper ore produced approximately 40,510,000 pounds of copper, valued at \$7,130,000, as compared with 41,421,000 pounds, valued at \$5,965,000, in 1928. Silver is recovered as a by-product from the ores which contain copper and gold, hence the sharp decline in the price of silver has not affected mining in the Territory in the same degree that it has in other mining countries where silver is the major constituent of the ores. In 1929, 472,900 ounces of silver, valued at \$252,000, were recovered. Lead occupies a position in the mineral output of Alaska similar to that of silver in that it is recovered as a by-product in the mining of other metals. There are no lead mines in Alaska and practically the entire quantity produced is recovered from the property of the Alaska Juneau mine in southeastern Alaska. In 1929 approximately 2,630,000 pounds were recovered and this is the largest yearly production since mining began in the Territory. Coal production from three operating mines was 100,600 tons and although this is less than the output for 1928, it has been exceeded in only three years since coal mining began in Alaska. Approximately 56,000 tons of coal were imported, all of which could be supplied by the Alaska mines if transportation

facilities were available. Several attempts have been made to provide this transportation but there are many adverse factors to be considered and it is not probable that the local product will supplant the imported coal for some time.

For many years varying quantities of marble have been exported from the deposits in southeastern Alaska. Rough blocks are quarried and shipped to Tacoma or San Francisco where they are prepared for market. The large columns and the interior finish in the new capitol building at Juneau came from this source.

Limestone is mined on Dall Island near Ketchikan. About 128,788 tons of limestone, containing approximately 97.5 per cent calcium carbonate, were shipped during 1929. There are almost inexhaustible deposits of limestone available for this industry and much of it is close to tidewater where it can be easily and cheaply mined.

Fishing.

The total value of fishing products in 1929, exclusive of aquatic furs, was \$50,795,819, a decrease of \$3,749,769 from 1928 when the value was \$54,545,588. These figures represent the value of the manufactured product. It is estimated that the value of the catch to the fishermen was approximately \$16,582,000. The value of the output of canned salmon was about 95 per cent of the total value of all the products of the salmon industry. The production of mild-cured salmon declined in quantity but increased in value over the average for the previous 5-year period, the pack being valued at \$1,241,723 in 1929. Although the major part of the salmon is prepared for the market by canning an appreciable number are treated by pickling, freezing, drying, and salting. The herring industry experienced an unusual condition which resulted in a decline in the output of pickled fish and an increase in the production of meal and oil. Abundant runs of small herring appeared in many districts but there was an unusual scarcity of fish large enough for curing. The total value of the herring products in 1929 was \$2,794,084 as compared with \$3,098,457 in 1928. Induced by more favorable market conditions the halibut fishermen exerted greater efforts to increase their catch and as a result there was an increased production. One thousand two hundred and fifty-three persons landed approximately 37,456,998 pounds of halibut, valued at \$4,422,605, as compared with 31,567,000 pounds, valued at \$3,094,000, in 1928. The output from the cod fisheries increased materially over that of 1928. The total value of the products of the whaling industry in 1929 was estimated to be \$502,081. The operations of the clam industry during 1929 showed approximately a 90 per cent increase over 1928 with a pack of 28,001 cases, valued at \$203,656.

Seal herds.

The census of the seal herds on Pribiloff Islands is computed in August each year and the Bureau of Fisheries estimate the increase to be 100,014 for the year ending August 10, 1929, an increase of approximately 11 per cent over 1928. It is significant to note that this increase is about 75 per cent of the original herd which was 132,000 in 1910 when the Government assumed control of the herds. The total number of seals of all ages and classes in the herds is estimated to be 971,527. Forty thousand and sixty-eight fur seal skins were taken from the Pribiloff Islands during 1929. This is the largest number taken in any year since the Government assumed control and also larger than any annual take since 1889 when 100,000 skins were obtained by the lessees then in control.

Lumber.

Forest Service officials estimate that it is possible to cut 1,000,000,000 board feet each year in perpetuity from the national forests, of which there are two in Alaska. Two units of pulp timber, aggregating 5,000,000,000 board feet of 834,000 cords each, have been acquired by companies capable of developing it and installing the necessary plants for manufacturing paper. All preliminary steps have been completed and are awaiting the final permit from the Federal Power Commission, so that construction may be undertaken.

Aerial surveys.

In 1926 the United States Navy, in cooperation with the United States Geological Survey and the Forest Service, began an aerial survey of southeastern Alaska. The first year about 50 per cent of the work was completed. No further work was done until 1929 when a second expedition was organized, and although they experienced some unfavorable weather, the work was practically completed before the close of the season. The excellent results achieved by these expeditions demonstrated the value of the photographs in obtaining information that is of inestimable value in estimating the timber resources, selection of water-power sites, and location of roads and trails. Adequate transportation facilities are essential to development and many of the mining districts and known agricultural areas can not be brought into production unless they are made easily accessible. The Territory cooperates with the Federal Government in the construction of roads, trails, and airplane landing fields. The Alaska Road Commission is responsible for the construction of these improvements outside of the National Forests and the Bureau of Public Roads is charged with similar work in the forest reserves. The funds for the construction of roads, trails, and landing fields are derived from Federal and Territorial appropri-

ations. These expenditures during 1929 amounted to \$1,685,928 from all sources. This amount covers construction and maintenance, new construction for 1929 being approximately 57 miles of new road, 38 miles of trail, 11 landing fields for airplanes, 14 shelter cabins, and 780 linear feet of bridges. Less than 10 years have elapsed since the first United States mail was carried by airplane from Fairbanks to McGrath. It demonstrated the practicability of winter flying in Alaska and proved the value of air transportation in the commerce of the Territory. Since that date the Territorial government has constructed 63 landing fields in strategic places, and now it is possible to reach hitherto isolated towns and villages in a few hours. Furs, mail, express, and passengers are transported with safety and comfort during all seasons of the year. In 1929, 3,654 passengers were carried for a total of 684,361 passenger miles without the loss of a plane or passenger. Practical assistance can be extended to aviation and a necessary service rendered to the Territory by the establishment of air-mail routes.

The new Federal and Territorial building is under construction and it is expected that it will be ready for occupancy about January 15, 1931. This building will house all of the Federal activities and most of the Territorial offices.

The governor's recommendations.

The governor makes the following recommendations:

1. Contracts for sale of approximately 5,000,000,000 feet board measure of timber, to be used in the manufacture of paper, have been awarded by the Department of Agriculture. Completed applications for power licenses, accompanied by reports by Government engineers, have been submitted to the Federal Power Commission. Construction work on the necessary manufacturing and power plants can not proceed until the Federal Power Commission considers the applications. Early consideration of these applications is urged. The utilization of the timber and the construction of the plants will give Alaska another major industry and at the same time supply the markets of the United States with a duty-free product.

2. There are now five airplane transportation companies operating in Alaska. They have demonstrated the feasibility of air transportation during all seasons of the year and several of them have been operating over some of the routes a sufficient length of time to comply with the requirements of the law. The Territory has aided by constructing landing fields and airports in strategic places. There is adequate equipment available and mails can be transported regularly and speedily. Air mail on the principal routes is justified and should be authorized.

3. In many sections, particularly the Yukon-Kuskokwim area, the low prices of fur and the somewhat limited catch has deprived the native trappers of their usual method of obtaining supplies. Many of them are faced with privation unless the closed seasons on fur bearers are modified. This situation is known to the Alaska Game Commission and they have recommended certain changes. These changes should be approved and the native should be permitted to catch a limited number of beaver and other fur bearers.

4. Congress has authorized the improvement of the harbors of Ketchikan, Port Alexander, and Seward, but funds are not available for these projects. The improvements are most essential to provide safe anchorages for a constantly increasing fleet of fishing boats. Appropriations for these projects will afford relief to many who will otherwise be unemployed during the next year.

Mount McKinley National Park.

Mount McKinley National Park, the farthest north and second in area among national parks offers excellent accommodations for tourists and each year there is an increase in the number of visitors. Passengers may now travel by auto for 43 miles in the park. When this road is completed visitors may ride almost to the base of the majestic peak.

Reindeer.

In November, 1929, the supervision of the reindeer service was transferred from the Office of Education to the Governor of Alaska. The increase in the number of deer from the original herds of approximately 1,300 to the present herds estimated to contain more than 600,000 animals in about 40 years has clearly shown that they may be made a factor in the food supply of the country. As originally planned it was intended that the deer should supply the native with food and clothing. This purpose has been achieved but the herds have increased to the point where they are sufficient for marketing. The most important problem confronting the owners at the present time is the marketing. Efforts are being made to arrange for a nation-wide distribution of the reindeer products.

Furs.

The value of the furs, exclusive of seals, shipped from Alaska in 1929 was \$4,513,863.76, an increase of \$200,000 over the previous year.

Schools.

One of the most difficult problems in a sparsely populated country is to provide adequate school facilities for all of the children. The schools of Alaska are supported by funds derived from two sources.

The Territorial government provides appropriations from the Territorial revenues and the Federal Government by direct appropriations meets the expenses of the native schools. The Office of Education, United States Department of the Interior, has supervision over the native schools and the Territorial schools are under the jurisdiction of the Territorial commissioner of education. Last year the Territory maintained 15 high schools and 89 elementary schools; 253 teachers were employed for 5,066 pupils, at a cost of \$594,662.43. The Office of Education maintained 93 schools for natives, including 3 industrial schools, and employed 195 teachers for an enrollment of 3,899 pupils, at a total cost of \$443,380.45.

Medical service.

Medical service for the natives is also under the Office of Education and last year seven hospitals were maintained and in addition three physicians were employed in localities where hospitals are available. The Yukon River region was served by the hospital boat *Martha Angeline*, which carried a doctor, dentist, and nurse and visited the villages along the Yukon River. In all, there were 61 doctors, dentists, and nurses engaged in attending to the health of the native people. The Yukon medical boat supplies the only available service for several thousand people who reside along the Yukon River and its tributaries. Without it many of these people would not see a doctor, dentist, or nurse unless they traveled hundreds of miles at great expense.

5. The reindeer herds in Alaska have increased in numbers until the supervision by the teachers in the several districts is not satisfactory. They must be given careful attention by trained personnel. There is grave danger of crowding the ranges beyond their carrying capacity and the overgrazing of the principal ranges will cause irreparable damage. Plans for an organization, to administer the reindeer industry for the natives until they are capable of assuming the responsibility themselves, have been submitted. The approval of this plan and the appropriation of necessary funds to put it into effect is suggested.

6. The hospital boat that has been in operation on the Yukon River and its tributaries for several years is unsafe and not adequate for the service. This floating hospital serves thousands of natives and others who live along the rivers of the interior of Alaska and who would be otherwise without medical aid. This is the only practical way of giving them this service and a new boat is justified and urgently needed.

7. There are many localities in the more remote sections, where hundreds of natives reside, without schools or hospitals. It is realized that it is impossible to provide all of these facilities in one

year, hence a program will be arranged for authorization over a 5-year period. The most urgent demands will be met each year. The adoption of this program will obviate the necessity of presenting numerous applications to the Budget each year and will spread the capital expenditures over a long period. It is believed this will be more satisfactory to all concerned.

8. For several years attention has been directed to the conditions which exist in the halibut fisheries. It is known that many of the areas have been depleted and that protection must be given to existing fishing grounds if the fisheries are to be perpetuated. The International Halibut Commission has made a careful study of the situation and submitted reports to the Governments of the United States and Canada. The Canadian Government has approved the treaty which will give ample authority to the Fisheries Bureau to enable them to control the fishing. This treaty is now pending before the Government of the United States and should receive early consideration.

9. The United States Bureau of Fisheries should be provided with appropriations which will enable them to complete the investigations of the herring fisheries and also to make a survey of the waters of Bering Sea and Pacific Ocean along the Alaska Peninsula and Aleutian Islands to determine whether or not there are available halibut fisheries in those areas.

10. The Territorial government has appropriated substantial sums for investigations to determine practical methods of destroying reindeer parasites and to study possible control of predatory animals. The Territory, with its limited financial resources, can not carry out either project without further assistance from the Federal Government.

THE ALASKA RAILROAD

SUMMARY OF THE GENERAL MANAGER'S REPORT

In pursuance of the program of improvements, the rehabilitation of the main track between Nenana and Browne, distance 30.5 miles, consisting of ditching, bank widening, grade raising, and ballasting was completed, which improvement reduces maintenance cost and insures safe and smooth train operation at increased speed with no hazard of derailment.

To eliminate snowslide hazard, Bridge 49.3, located south of Tunnel Station, was filled in with gravel with four lines of 6-foot culverts to take care of the drainage. The fill is now 50 per cent completed, balance to be completed this year. This bridge has been carried away by snowslides three times in the past.

To replace old, dilapidated, unsafe, wooden coaches and baggage cars, there were purchased two steel baggage cars, three steel coaches, and three steel dining cars, all second hand. One of the diners was converted into an observation car, the other two cars will be converted into parlor car and coach, respectively, during the year, work to be done in the Anchorage shop. The purchase of this equipment permitted the placing in service at the start of the tourist season June, 1930, one solid steel train composed of one combination baggage and smoker, two coaches, and one observation car and two other steel trains, except the observation cars. These cars, including the alterations, cost less than 50 per cent of the price of new cars.

The project of development and settlement of land adjacent to the Alaska Railroad, which was inaugurated during the fiscal year 1929 with a view of increasing the revenue, was carried on during the last year. Besides an awakening of interest, there was a more active participation in agricultural work among the settlers located along the railroad. During the year 12 homesteaders from the States, most of whom have families, located homesteads in the Matanuska Valley. Although this number is not large, it is felt that it is a good beginning and that in the next few years the result of their work placed before the public will be the cause of inducing many more to locate there.

The total expense of the railroad in excess of revenues (including nonoperating income) for the year was \$1,231,998.14 as against \$950,711.74 in 1929, an increase of \$281,286.40.

This increase in deficit is due to decrease of revenues (including nonoperating income), \$83,082.66; increase of expenses, \$198,203.74. The decrease of revenues was caused by closing of railroad power plant at Anchorage, \$59,826.06; reduction in passenger earnings.

rail line, \$10,560.69; earnings of river boats, \$18,554.45; other revenues, \$6,570.38. There was an increase of \$8,395.40 in rail freight and \$4,033.52 in Curry Hotel earnings. There was a decrease of \$10,697.56 in passenger revenues, rail line, in June, 1930, as compared with June, 1929, due to cancellation of tourist business. The decrease in river boat earnings was due mainly to scarcity of fur-bearing animals in the river territory. This decrease had an adverse effect upon rail line earnings as well.

The increase in expenses (\$198,203.74) occurred mainly in maintenance of way and structures (\$182,844.19), maintenance of equipment (\$12,752.03), traffic (\$35,331.36), general expenses (\$9,292.17), with reduction of \$40,738.71 in expenses of miscellaneous operation, due to closing of power plant.

The increase in maintenance of way expenses resulted from greater activity in work on the main track to insure safe and economical operation and reduce further track and equipment maintenance expense. Roadway maintenance expense increased \$46,997.56, tie renewal \$15,440.52, other track material \$9,387.37; track laying and surfacing \$60,259.28, rehabilitation of telegraph and telephone lines \$25,277.62; shops and engine houses, \$4,859.63; wharfs and docks, \$20,307.48, extensive repairs required on Nenana river front.

There was increased activity in the repairs of freight and work train equipment permitting reduction of such expenses during the following year. Traffic expenses increased through expansion in solicitation of tourist travel and efforts to promote industrial and agricultural development in the railroad territory.

The amount of material and supplies carried in store stock was reduced \$210,941.38, leaving on hand \$664,004.69 at the end of the fiscal year.

During the fiscal year, 174,780 ties were used as replacement in the track, which is 12,713 more than was used during the previous year.

The pay roll for the fiscal year 1929 amounted to \$1,746,381.59, while in 1930 it amounted to \$1,977,866.88, an increase of \$231,485.79, or 13.25 per cent.

Maintenance.

The work of ballasting, raising grade, and bank widening was carried out between mile 393 and mile 431.

On the telegraph and telephone line between Seward and Anchorage a total of 82 miles of poles that were rotted were replaced by treated cedar poles and 3 miles replaced between Mile 114 and Mile 117. Between Indian and Kern and Whitney and Willow 79 miles of telegraph and telephone pole line was reconditioned so that the line is good for at least three years.

Tourist traffic.

Tourist traffic showed a gain over 1929 and the number of tourists stopping off at McKinley Park was considerably greater than in previous years, indicating an increasing interest in the park. In June, 1930, there was a falling off of tourist traffic and the number of reservations canceled indicates that tourist travel will be light during the summer of 1930.

Curry Hotel.

Guest days at the hotel totaled 12,323, an increase of 1,094 over the number for 1929.

Financial.

Passenger revenue from rail operation amounted to \$200,434.17, a decrease under the previous year of \$10,560.69, or 5 per cent.

Freight revenue from rail operation amounted to \$677,752.16, an increase over the previous year of \$8,395.40, or 1.25 per cent.

Rail revenue from all sources was \$1,099,843.22, a decrease of \$66,067.28, or 5.6 per cent.

Passenger revenue from river-boat operation amounted to \$14,509.95, a decrease under the previous year of \$5,046.35, or 25.8 per cent.

Freight revenue from river-boat operation amounted to \$41,658.26, a decrease of \$11,308.81, or 21.35 per cent.

All revenue from river-boat operation amounted to \$81,586.21, a decrease of \$18,554.45, or 18.5 per cent.

Revenue from all sources, including nonoperating income, was \$1,186,551.41, a decrease of \$83,082.66, or 6.54 per cent.

Rail-line expenses for maintenance and operation amounted to \$2,321,210.03, an increase over the previous year of \$196,885, or 9.26 per cent.

Rail-line commercial freight, exclusive of coal, amounted to 34,545 tons, a decrease of 2,730 tons, or 7.9 per cent, under the previous year.

Although there was a decrease in the amount of revenue tonnage hauled, there was an increase in rail-line freight revenue. This is accounted for by the fact that during 1929 there was a large portion of the tonnage, such as mining machinery, moved at a low freight rate.

Coal tonnage was 57,766, an increase of 918 tons, or 1.6 per cent.

Revenue passengers carried were 43,283, a decrease of 9,894, or 18.6 per cent. Part of this decrease was caused by a reduction in the number of passengers handled between College and Fairbanks, which was 5,570 revenue passengers less than last year, due to use of automobile and bus competition.

Transportation revenue received by the rail line amounted to \$929,734.11, a decrease of \$4,824.89, or 0.5 per cent.

Transportation service.

Operating conditions were worse than in previous years, due to an increased number of washouts, rock and mud slides caused by wet weather, and also an increased number of snowslides.

General business conditions and outlook for traffic in future.

The mining operations in the Fairbanks district indicate increased and continued activities. The Fairbanks Exploration Co. imported two additional dredges which were assembled last fall and placed in operation in the spring of 1930.

Mining activities in the Willow Creek district is on the increase, and it is predicted that several of the properties in this region will prove good producers.

The Kantishna region, reported as a highly mineralized zone, is being investigated to a certain extent by mining engineers, including one from the Geological Survey.

The prospects for further increase in mining activities is largely dependent upon what steps are taken to encourage and aid prospectors, which are falling off in large numbers. It is the opinion that steps should be taken by the Territory to initiate such movement, and it is also considered important that the Geological Survey continue its activities in the railroad belt.

Coal mines in the rail belt produced approximately 120,000 tons of coal, or 7,000 tons more than in the previous year, of which 800 tons were through the efforts of the Alaska Railroad purchased by the Bureau of Education, and it is anticipated that this bureau will increase its purchases from Alaska coal mines in the future, as a report has been received from the Bureau of Education indicating extremely satisfactory results from use of Alaska coal.

Every endeavor will also be made to secure contracts from other governmental bureaus operating in Alaska, including the Chilkoot Barracks at Haines, at which point the annual requirement is about 2,000 tons, also fish canneries, for delivery of Alaska-produced coal; the annual coal consumption in the Territory is approximately 250,000 tons.

General business in other lines for the coming fiscal year do not show very good prospects, in fact a considerable decrease is expected in tourist travel and freight tonnage, attributed to the business depression in the States, and which is reflected in the Territory.

It was expected that the contemplated expansion of the reindeer industry would materialize during the coming year, but owing to business depression in the States this is doubtful, but substantial progress has been made toward interesting financial support for the forming of a corporation to undertake development of this industry.

THE TERRITORY OF HAWAII

SUMMARY OF THE GOVERNOR'S REPORT

The Governor of Hawaii, Hon. Lawrence M. Judd, in his annual report, states that he visited all of the inhabited islands of the group, including the small islands of Kahoolawe and Niihau, to secure first-hand information in relation thereto in order to deal more intelligently with the problems confronting the people of the Territory. He states that it has been possible to make these inter-island trips with very little loss of time from the capital, due to the inauguration during the past year of a regular commercial air service, bringing the islands within a few hours of each other where a few decades ago it took days.

Acknowledgment is made of the splendid cooperation of the Army and Navy authorities in furnishing air transportation and in placing at his disposal on numerous occasions aircraft to transport him to points not touched by the commercial company operating.

Temporary offices were maintained during the year in the annex of the library of Hawaii, necessitated by the rehabilitation of the capital building, for which the Territorial government had made appropriation.

Harbor improvements.

During the year a new harbor on the island of Kauai at Nawiliwili was completed, the dredging and most of the work upon the break-water being performed by the Federal Government and the balance provided for by Territorial appropriations.

Cane sugar.

The production of cane sugar continues to be the main industry of the Territory. The 1929 crop, amounting to 914,637.53 short tons, established a new high record. The price of raw sugar averaged 3.7638 cents per pound. During the year sugar reached the lowest price level ever known in the history of the Territory. At the low prices prevailing, many Hawaii sugar plantations will not get back a new dollar for the old one invested in the crop production. The Hawaiian plantations, due to the conservative financial policy under which managed, have so far continued their operations without affecting the basis of pay of employees, which is of material benefit to the Territory as a whole.

On December 31, 1929, there were 99,693 persons living on sugar plantations in plantation houses, and in addition there were several

thousand persons engaged in sugarcane cultivation, as homesteaders, independent planters, etc.

Labor conditions on the plantations have been particularly good during the year. Relations between employers and employees have been continuously amicable, and no labor disturbances or disputes have arisen. The total number of employees on sugar plantations was 56,117, of whom 2,757 were on a monthly basis and 53,360 on a daily basis.

Pineapples.

The growing and canning of pineapples, the Territory's second industry, also set a new high record for 1929, the pack amounting to 9,211,376 cases. The value of the crop, however, due to low prices, was a decrease over the previous year, notwithstanding the fact that the demand has been unusually strong and canneries have found it difficult to fill orders.

Coffee.

The coffee industry is in good condition. Bearing coffee fields embodied about 4,740 acres. There has been a marked increase in coffee production during the last 10 years. In 1920-21 it was 4,600,000 pounds, in 1929-30 it was 7,000,000 pounds; and the estimated crop for 1930-31 is 9,000,000, provided the climatic conditions remain normal. The most serious problem in coffee production to-day is the control of rats, which cause damage to the extent of \$100,000 annually by destroying the berries when ripe and chewing up the young growing branches. Efforts are now being made through proper channels to exterminate them.

Tourist travel.

As a result of the Territory's increased advertising expenditures in conjunction with sufficient hotel accommodations and adequate steamship facilities, a new record for tourist travel to Hawaii was established in 1929, with a total of 22,190 tourists, nonresident arrivals, who spent two days or more in Hawaii. This is a very substantial gain over the 19,980 who vacationed in the Territory in 1928.

An outstanding development was the inauguration of the Canadian Pacific's Vancouver-Honolulu-Orient service. The Dollar Steamship Co. added a new steamship to its fleet.

The Inter-Island Steam Navigation Co. placed in service two new passenger steamers.

Daily airplane service between the islands of Oahu, Molokai, Maui, and Hawaii was established by the Inter-Island Airways (Ltd.), which has proven to be extremely popular.

Facilities for the care and entertainment of guests are keeping step with the increase in tourist travel.

Hawaii National Park.

Hawaii National Park continued to show a steady growth in development and attendance. The latter has now passed the 100,000 mark, reflecting increased use by island residents as well as by travelers.

Finances—Governmental.

The income of the various counties aggregated \$13,133,367.89 as against \$11,650,687.58 for the prior year. The assessment of real and personal property in the Territory as rendered by the tax assessors for 1930 aggregated \$21,908,534 as against \$20,584,702 for the prior year. The total revenue collected by the Territory aggregated \$12,530,357.04, and the total expenditures were \$11,666,956.38. The budget statement of general fund resources and obligations as of June 30, 1930, shows the total resources at that time to be \$7,850,528.62.

Local governments in Hawaii were first established on July 1, 1905, the Territory being divided into four counties. On July 1, 1909, the county comprising the island of Oahu was converted into a city and county, known as the city and county of Honolulu, with a mayor. The other counties are Hawaii, including the island of that name; Maui, including the islands of Maui, Kahoolawe, Lanai, and all of Molokai, except the leper settlement; and Kauai, including the islands of Kauai and Niihau. The leper settlement on Molokai constitutes a fifth county, Kalawao, but is under the control of the Territorial board of health.

Bonded indebtedness.—The total bonded debt on June 30, 1929, was \$29,760,000, which was increased by \$1,945,000, on November 1, 1929, issue of 4¾ per cent public improvement bonds. The details are set forth in the following table:

Bonded debt June 30, 1930

Date of issue	Term years	Rate of interest	Sale price	Percentage basis	Aggregate outstanding	Date due	Where payable, principal and interest
		<i>Per cent</i>					
Aug. 1, 1911	20-30	4	101.5875	3.88	\$1,500,000	Aug. 1, 1941	New York and Honolulu.
Sept. 3, 1912	20-30	4	100.5887	3.985	1,500,000	Sept. 3, 1942	Do.
Sept. 15, 1914	20-30	4	100.01	4.00	1,430,000	Sept. 15, 1944	Do.
May 15, 1916	20-30	4	100.00	4.00	1,750,000	May 15, 1946	Do.
Aug. 1, 1917	20-30	4	98.04	4.08	1,500,000	Aug. 1, 1947	Do.
Sept. 15, 1919	20-30	4½	102.814	4.377	1,500,000	Sept. 15, 1949	Do.
Sept. 15, 1920	20-30	4½	98.01	4.59	2,400,000	Sept. 15, 1950	Do.
Dec. 15, 1920	20-30	4½	98.01	4.59	200,000	Dec. 15, 1950	Do.
Dec. 31, 1920	20-30	4½	98.01	4.59	600,000	Dec. 31, 1950	Do.
June 1, 1922	20-30	4½	103.365	4.25	1,350,000	June 1, 1952	Do.
Oct. 1, 1923	20-30	4½	99.577	4.52	1,800,000	Oct. 1, 1953	Do.
Do -----	20-30	4½	99.577	4.52	75,000	----- do -----	Do.
Apr. 1, 1924	20-30	4½	99.078	4.56	2,285,000	Apr. 1, 1954	Do.
Oct. 1, 1925	20-30	4½	101.042	4.39	2,590,000	Oct. 1, 1955	Do.
May 1, 1926	20-30	4½	105.125	4.27	1,540,000	May 1, 1956	Do.
Oct. 15, 1926	20-30	4½	103.196	4.26	1,805,000	Oct. 1, 1956	Do.
Jan. 15, 1927	20-30	4½	104.82	4.18	385,000	Jan. 15, 1957	Do.
Nov. 15, 1927	20-30	4½	107.22	3.98	50,000	Nov. 15, 1957	Do.
Do -----	Serial.	4½	106.06	3.98	2,750,000	1932-1956	Do.
May 15, 1928	Serial.	4¾	102.37	4.07	1,575,000	1933-1957	Do.
Feb. 1, 1929	Serial.	4¾	100.093	4.24	1,175,000	1934-1958	Do.
Nov. 15, 1929	Serial.	4¾	101.529	4.62	1,945,000	1934-1958	Do.

Total, \$31,705,000.

Finances—Private.

Bank deposits at the end of the year amounted to \$80,174,748.50, of which \$46,232,391.03 were commercial deposits and the remainder, \$33,942,357.47, were savings deposits. The savings accounts by races were as follows: Japanese, 56,125; Chinese, 16641; Hawaiian, 21,325; Portuguese, 11,542; Filipino, 14,868; all others, 42,110; a total of 162,611.

During the year 110 corporations were created and 49 were dissolved, as follows:

	Created	Dissolved
Mercantile.....	81	--
Mortgage and investment.....	9	45
Eleemosynary.....	18	--
Savings and loan.....	1	4
Transportation.....	1	--
	<hr/> 110	<hr/> 49

Leaving at the end of the year 1,189 domestic corporations, an increase of 61. The total capitalization of domestic corporations other than eleemosynary is \$311,533,678, an increase of \$17,106,380, or 5.49 per cent for the year. Foreign corporations to the number of 214 were authorized to do business in the Territory.

Fire-insurance premiums during the calendar year 1929 amounted to \$1,628,229.12, and the fire losses paid aggregated \$463,640.76. The marine-insurance premiums amounted to \$385,350.49 and the losses amounted to \$33,789.16. Life insurance written was valued at \$17,976,695 and the premiums thereon aggregated \$774,865.79. The renewal premiums were \$3,684,188.26 and the losses paid amounted to \$992,868.87.

Public lands.

The public lands of the Territory of Hawaii comprise all the remaining portions of the lands which previous to August 15, 1895, were known as "Government lands" and "Crown lands" and any other lands which have been acquired by the Government in any manner since that date. These lands are administered by the commissioner of public lands under the provisions of section 73 of the Hawaiian organic act, as amended, and include an estimated total area of 1,590,000 acres.

Land-patent grants.

One hundred and fifty land-patent grants were issued, covering a total area of 1,316.561 acres, valued at \$159,130.99; 48 were on homesteads, covering a total area of 1,206.896 acres, valued at \$44,993.27; 60 were on time-payment agreements covering a total area of 44.674 acres, valued at \$32,230; 22 were on cash purchases, cover-

ing a total area of 19,807 acres, valued at \$81,131.72; 20 were on land exchanges conveying a total area of 45.184 acres, plus a cash consideration of \$285.70 to acquire privately owned lands for public purposes, for which the Territory received a total area of 56.637 acres, plus a cash consideration of \$776.

Five land patents were issued confirming five land commission awards covering a total area of 350.465 acres. Two, covering a total area of 7.857 acres, were in fee simple; three, covering a total area of 342.608 acres, carried a total Government commutation of \$205.83.

Eighty-three deeds were executed during the year. Thirty-five were exchange deeds, whereby the Territory received a total area of 24.34 acres, plus a cash consideration of \$776, for a total area of 26.744 acres, plus a cash consideration from the Territory of \$2,735.89. Thirty-eight were straight deeds, conveying to the Territory for public purposes a total area of 131.709 acres for a total cash consideration of \$73,087.82. Four were quitclaim deeds to the Territory, covering a total area of 0.651 acre for a total cash consideration of \$4, and six were quitclaim deeds from the Territory, covering a total area of 401.563 acres for a total cash consideration of \$56. Two hundred and twenty deeds, representing county transactions, were received for recordation and filing.

Population.

The population of Hawaii on April 1, 1930, as shown by the Fifteenth Census of the United States, was 368,336. Compared with a population of 255,912 in 1920, this shows an increase during the 10 years of 112,424, or 44 per cent. The population of the principal cities in the Territory is as follows:

Honolulu.....	137, 582
Hilo	19, 468
Wailuku.....	6, 998
Waipahu	5, 874
Lihue	2, 399

The area and population of the counties in 1930 are shown in the following table:

County	Area (square miles)	Population		Per cent increase since 1920
		Total	Per square mile	
City and county of Honolulu ¹	600	202, 923	338. 2	64. 3
County of Hawaii.....	4, 015	73, 325	18. 0	12. 9
County of Maui ²	1, 182	55, 541	46. 9	48. 6
County of Kauai ³	641	35, 942	56. 07	22. 1
County of Kalawao.....	11	605	55. 0	⁴ 09. 0

¹ Includes Midway.

² Includes islands of Maui, Kahoolawe, Lanai, and all of Molokai except Kalawao.

³ Includes islands of Kauai and Niihau.

⁴ Decrease.

Education.

During the year satisfactory progress is shown to have been made in the improvement of the public-school service. The enrollment in 181 schools increased from 70,000 in 1929 to over 73,000 in 1930, while the teaching staff has grown from 2,485 to 2,563 during the same period. Child health is one of the most important educational responsibilities. Impetus for improvement in this field was given by a number of important developments during the year. The following is a comparative table, by racial descent, of pupils attending all public schools in the Territory on June 30, 1930:

Racial descent	Number of public-school pupils	Per cent of total	Racial descent	Number of public-school pupils	Per cent of total
Hawaiian.....	3,321	4.54	Japanese.....	39,115	53.45
Part Hawaiian.....	7,679	10.49	Korean.....	1,719	2.35
Portuguese.....	6,091	8.32	Filipino.....	3,344	4.57
Porto Rican.....	1,163	1.59	All others.....	791	1.09
Spanish.....	258	.35			
Other Caucasian.....	2,993	4.09	Total.....	73,180	100.00
Chinese.....	6,706	9.16			

The following is a classification of pupils by birthplace:

	Hawaii	Maui	Oahu	Kauai	Total	Male	Female	Total	Per-centage of total
Born in the United States...	15,473	10,522	39,013	6,729	71,737	36,833	34,904	71,737	98
Foreign born.....	193	196	895	159	1,443	849	594	1,443	2
Total.....	15,666	10,718	39,908	6,888	73,180	37,682	35,498	73,180	100

Health.

Health conditions are fairly satisfactory. No outbreaks of communicable diseases were reported during the year. Forty-seven cases of leprosy were reported as against 66 for 1929. The research work on the ethyl esters of chaulmoogra oil were continued at the University of Hawaii. The greatest single health menace in the Territory is tuberculosis. There were 1,890 cases under the supervision of the board of health nurses, and in addition 779 cases were under the supervision of the Palama nurses. There were 11,933 visits made to the active, contact, and suspect cases of tuberculosis with the definite purpose of teaching the responsible members of these families the proper care of themselves and the other members of the family in relation to diet, rest, and hygiene.

Vital statistics.

The total number of births for the year was 10,873 as compared with 11,498 for 1929.

The number of deaths was 3,976 as compared with 4,481, a decrease of 505 for the year.

Marriages during the year were 2,401, a decrease of 311, or 11.5 per cent over the previous year. The marriage rate per 1,000 population was 6.54.

Under the Territorial retirement system the register on June 30, 1930, recorded a total registration of 5,919 since the inauguration of the system. During the year there was an increase of 536. An illustration of the gradual development of this system since January 1, 1926, is shown in the following table:

Year	Mem- ber- ship	Pen- sioners	Assets	Receipts	Disburse- ments	Adminis- tration expenses
June 30, 1926	2,028	84	\$124,699.81	\$174,876.78	\$147,527.43	\$16,780.71
June 30, 1927	2,682	101	481,502.31	522,282.81	505,688.96	14,921.83
June 30, 1928	3,385	115	1,069,831.03	760,769.81	733,644.78	21,567.65
June 30, 1929	3,963	132	1,831,378.16	1,014,049.12	879,964.79	22,907.78
June 30, 1930	4,524	174	2,666,239.08	1,214,433.05	966,591.05	22,587.22

Refund of accumulated contributions with interest at 4 per cent compounded annually was made in the following manner: On account of resignations and dismissals, \$41,917.12; paid to designated beneficiaries of deceased members, \$5,505.53, making a total of \$47,422.65.

ELEEMOSYNARY INSTITUTIONS

ST. ELIZABETHS HOSPITAL

SUMMARY OF THE SUPERINTENDENT'S REPORT

St. Elizabeths Hospital, established under the act of March 3, 1855 (10 Stat. 682), is a class A institution for the treatment of insane patients of the Army, Navy, and civilian employees, including those in the quartermaster pay class of the Army, the Navy, the Marine Corps, the Public Health Service, members of the Coast Guard, Veterans' Bureau beneficiaries; insane residents of the District of Columbia; United States prisoners before and after conviction; inmates of the National Home for Disabled Volunteer Soldiers and of the Soldiers' Home, Washington, D. C.; insane American citizens in the Canal Zone whose residence in the United States can not be ascertained; interned persons and prisoners of war under the jurisdiction of the Navy and War Departments, respectively; American citizens who have been legally adjudged insane in the Dominion of Canada; and beneficiaries of the United States Employees' Compensation Commission.

On June 30, 1930, there were 4,503 patients remaining in the hospital. The total number of patients under treatment during the year was 5,037. The total number of deaths was 204, compared with 252 for the previous year, a decrease of 48 deaths, and the total number of discharges, including deaths, was 534. The daily average population was 4,390, an increase of 188 over the preceding year.

Movement of patient population, fiscal year 1930

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1929.....	2,362	642	3,004	810	517	1,327	4,331
Admitted during year ended June 30, 1930....	450	84	534	95	77	172	706
Total number under care and treatment during year ended June 30, 1930.....	2,812	726	3,538	905	594	1,499	5,037
Discharged as—							
Recovered.....	87	0	87	10	4	14	101
Improved.....	89	8	97	2	5	7	104
Unimproved.....	52	15	67	15	18	33	100
Not insane.....	18	3	21	2	2	4	25
Total discharged.....	246	26	272	29	29	58	330
Died.....	82	51	133	46	25	71	204
Total of patients discharged and dead..	328	77	405	75	54	129	534
Number of patients remaining June 30, 1930..	2,484	649	3,133	830	540	1,370	4,503

At the end of the fiscal year the number of patients was 172 greater than at the beginning of the year. Of these, 87 were cared for out of the appropriation as carried in the Interior Department appropriation act and 85 reimbursed the hospital from other sources.

During the past year there were 706 admissions to the hospital—450 white males and 95 white females, a total of 545 white patients; 84 colored males and 77 colored females, a total of 161 colored patients.

There were 606 first admissions during the year, 459 men and 147 women. Of these, 535 were citizens by birth, 40 were citizens by naturalization, 25 aliens, and 6 citizens unascertained.

According to race, 146 were African (black), 3 Chinese, 124 English, 1 Finnish, 3 French, 16 German, 2 Greek, 16 Hebrew, 25 Irish, 11 Italian, 3 Lithuanian, 6 Magyar, 3 Mexican, 3 Pacific Islanders, 2 Portuguese, 6 Scandinavian, 13 Slavonic, 2 Spanish, 3 Syrian, 2 Welsh, 191 mixed, and 25 race unascertained.

The readmissions numbered 100—73 males and 27 females—less than one-sixth of the number of the first admissions.

The supplies produced on the hospital reservation, including farm and garden products, shoes, brooms, articles made in sewing and mending rooms, output of the bakery, laundry, power, heat, and lighting plant, and mattress shop, were valued at about \$750,000 during the year 1930. Included in this were 20,000 gallons of ice cream, 263,000 gallons of milk, 13,500 dozen eggs, 1,000 bushels of tomatoes, 131,000 pounds of fresh pork, 853,000 loaves of bread, 3,100,000 rolls, 83,000 pounds of pastry, 7,200,000 pieces of laundry, 5,600 brooms, 2,000 brushes, 1,500 mattresses, 1,350 pillows, 12,000 pairs of shoes and slippers, besides steam, electricity, water, ice, and refrigeration.

The most outstanding improvement on the farm during the year was the construction of a 23,000-gallon reservoir at Godding Croft. This is fed by gravity from a number of springs located around the west slope of the hill. It is expected that this reservoir will greatly relieve the water problem, which in the past has been quite acute during periods of extended drought.

Giving consideration to the plans of the hospital for building the roads contemplated by the National Park and Planning Commission and consideration for using the Congress Heights farm for a playground, there will be little or no land left to the hospital for farming and truck gardening. It will be necessary to purchase additional land for this purpose. Congress should authorize the purchase of approximately 5,000 acres of land several miles from the city proper in order to establish a farm colony to which to transfer the dairy and piggery, and concentrate all the farm and garden work in one place. Cottages could be erected for the housing of about 400

patients, and practically all the vegetables and food products that could profitably be produced could be raised.

The increased number of patients in the hospital requires additional personnel and additional quantities and classes of supplies. During the past year there has been disbursed for care and treatment of patients, construction, and trust funds, about \$4,000,000. Supplies have been purchased amounting to \$1,625,000. One hundred and ninety-three contracts were entered into for supplies to the total amount of \$900,000.

The total number of employees in the hospital June 30, 1930, was 1,302. Five employees were retired.

The medical and surgical building for which Congress appropriated \$875,000 is nearing completion and will be occupied in a short time. This building will contain 200 beds for medical and surgical patients. It will also permit the concentration in one building of the various clinics, including eye, ear, nose and throat, dental, antiluetic, neurological, dermatological, gynecological, etc. It will also house the nursing school and will contain not only classrooms but model wards and diet kitchen. Provision is also made for X-ray tables for various purposes, including fluoroscopic, dental, bedside, and deep therapy units, as well as for a pharmacy and drug-storage and narcotic vault; in general, all facilities required for the medical and surgical care of the hospital's patients.

Congress has appropriated \$120,000 for the erection of a building for tubercular patients. Plans and specifications are at present being prepared to build a 1-story building of about 40 beds; this building will be so constructed that if additional beds are required, another story may be added for a similar number of patients.

An appropriation of \$300,000 was made toward the construction of a male-receiving building to contain 400 beds. The Secretary of the Interior was authorized to enter into a contract for a sum not to exceed \$1,050,000 for the completion of this building, including furniture and equipment. Plans and specifications are being prepared for this building.

Nine students graduated in the nurse and psychiatric-aide class during the year. Efforts have been made to enlarge the student-nurse class. There are 2 students in the senior class for the coming year, and 25 students in the 1932 class. The United States Civil Service Commission has put on an advertising campaign all over the United States in order to attract students for the course to be begun this fall. There have been received some 400 applicants, of which 30 were selected for instruction.

The Red Cross has continued to maintain a hospital unit during the past fiscal year, consisting of 3 psychiatric social workers, 1 of whom is the field director, 3 recreation workers, and 3 secretaries.

It has charge of the various forms of recreation at the hospital, and has furnished the patients with 12 band concerts, 60 moving-picture shows, 175 parties and entertainments, and 220 ward programs. The work of the recreation department, conducted by the recreational worker, the athletic director, and the hostess, has continued to furnish outdoor entertainment to all the patients that it was possible to reach, and during the past year has attempted to develop a more active type of recreation than formerly employed.

Attention is again called to the necessity for a complete revision of the lunacy legislation in the District of Columbia. Discussing this matter in detail the superintendent states that:

On February 7, 1927, the Secretary of the Interior transmitted to the chairman of the Committee of the District of Columbia, House of Representatives, bills changing the method of admissions to St. Elizabeths Hospital. These bills were introduced in Congress, and bore the numbers H. R. 17045 and H. R. 17137 of the second session of the Sixty-ninth Congress. The main changes from the existing legislation were:

(1) Provision for voluntary commitment for treatment, on request of patients, with provision for discharge on three days' notice.

(2) Provision that insane taken into custody by the police or other officials shall not be subjected to trials as are criminals, but may be held in the hospital and treated, and not tried except upon their requests or that of their relatives, guardians, or friends.

(3) If a trial is demanded by an insane person, his guardian, or friends, or by court, upon petition, the insane person shall be heard by the court, and not subjected to trial by jury unless the insane person, his relatives, guardian, or friends demand it.

(4) Temporary commitment or detention is provided for, with provision that during such temporary commitment, and prior to formal commitment, the person may be released upon certificate to the District of Columbia by the superintendent of the hospital or by two physicians in regular attendance at any other hospital that the person is not insane or has recovered his or her reason.

(5) Provision for the automatic restoration of the civil rights of patients discharged from the hospital on certificate of the superintendent that they are cured or that further treatment is unnecessary or undesirable.

The proposed legislation recommended, it is believed, would make unnecessary so many writs of habeas corpus, and would make the release of patients to those competent to care for them simpler.

The proposed legislation would be in keeping with previous attempts to secure legislation amendatory of those portions of the District Code which deal with the admission, detention, and release of patients in the Government Hospital for the Insane (St. Elizabeths Hospital).

In the report of the Comptroller General of the United States (H. Doc. 605, 69th Cong., 2d sess.), suggestion is made that additional legislation on this subject is desirable.

A committee of medical advisers which made a survey of the hospital under the direction of the Secretary of the Interior made a number of recommendations for remedial legislation, but did not undertake to draft a measure for this purpose.

The design of the bill suggested was to provide a method more in keeping with the modern humanitarian and medical attitude toward this class of patients, and along lines which have proved effective in several of the States and in other countries.

Provision included providing for emergency commitment.

Authority is given the superintendent to consider paroling of patients as a therapeutic measure, and to permit the return of patients to their homes under the supervision of the hospital. This bill has to some extent been rewritten. It incorporates several modifications carrying out the original idea, copies of which have been submitted, by the District Commissioners, to the corporation counsel and have received his informal approval. Copies have been referred to the Solicitor of the Interior Department and, we believe, have received his approval. The proposed bill would not effect the commitment to a hospital of that class of persons certified by heads of departments and establishments under existing law.

Every effort should be made to secure the modification of the present laws governing admissions to St. Elizabeths Hospital and the enactment of the proposed or similar legislation.

We can not too strenuously urge this new legislation. We understand that with the exception of seven States in the Union the jury trial for purposes of commitment has been abandoned. If experience has demonstrated that the jury trial for the commitment of mentally sick people is wrong in so many States, it would seem that the same condition should apply to the District of Columbia and the residents of the District of Columbia should benefit by the experience that shows the need of this desirable change.

It has been so well said by a London correspondent in commenting on a report on mental disorders that "every facility should be afforded to the mentally ailing to submit voluntarily to treatment; but when compulsory detention is unavoidable, the intervention of the law should be as unobtrusive as possible."

This, we think, expresses the objective which should be sought, and therefore we urgently recommend the proposed change in the law for your consideration.

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FREEDMEN'S HOSPITAL

SUMMARY OF THE SUPERINTENDENT'S REPORT

Freedmen's Hospital was established under the control of the War Department by the act of March 3, 1871 (16 Stat. 506), and transferred to the Interior Department by the act of June 23, 1874 (18 Stat. 223). Prior to the time, however, that it was taken over by the War Department the hospital was an adjunct of the Freedmen's Bureau which was established 64 years ago, principally for the care of refugees who came to Washington at that time in great numbers.

The hospital was operated to full capacity throughout the year. Many applicants were refused admission, there being no available beds. The number of patients admitted was greater than that of any previous year, and the individual cases requiring special study and laboratory investigations likewise exceeded the number in this class for any similar period. On June 30, 1929, there were 209 patients remaining in the hospital. Four thousand three hundred forty-one were admitted during the year, making a total of 455 indoor patients under care. In the outdoor department a total of 14,826 were treated in the various clinics. It is gratifying to note that the number of men and women seeking to avail themselves of the opportunities for advancement along medical lines offered by the excellent clinical material found in the wards and dispensary of the hospital is increasing each year.

Applicants for staff-membership, internship, student-nurse, and student-dietitian training exceeded the accommodations of the hospital. The completion and occupation of the additions to the nurses' home, power plant, employees' quarters, and dining room were the most important improvements, supplying needs of long standing. Many changes for the better were made in the dispensary, particularly with reference to the records. Duplications have been eliminated, outdoor and emergency departments clearly defined, and orderly procedure of operation adopted.

The most important single need of the hospital is a clinical building to house the activities of the dispensary. The insufficient and unsatisfactory facilities in this department have existed a long while and should receive favorable attention. In addition to the benefit to be derived from this building by those who apply for treatment the medical college of Howard University will have for the first time satisfactory teaching facilities in making available for its students

the material presented in the several clinics of this department. It is also proposed to provide space in this building for the development of a much-needed physiotherapy service.

The construction of the obstetrical building, which was authorized last year, will be completed and ready for occupancy at the beginning of the next fiscal year. An increase in the personnel will therefore be necessary. Six graduate nurses, two maids, and two orderlies will be required for the satisfactory operation of this building.

The number of student nurses having been increased by Congress to 108, one instructor can not give the necessary time required for proper instruction, either elementary or advanced, and follow up on the wards with so large a number of students. Provision should, therefore, be made in the next appropriation bill for an additional full-time instructor. The organization of the social-service department was begun the latter part of May with one worker. It was recognized at the very beginning that one worker would be unable to carry on this important service in the manner desired, owing to the large number of patients attending the clinics. These clinics are in session from 9 a. m. to 2 p. m. daily, during which time the social worker must be present. Very little time therefore is left for follow-up work, and no attention whatever can be given those who are inmates of the hospital. These have important medical-social problems requiring solution, as urgent as those treated in the clinics, which can only be accomplished by the addition of another worker. The clerical work of the hospital has greatly increased during the last few years, so much so that it is with difficulty that this branch of the service is kept current. This is especially true in the office of the chief clerk, where only four clerks are employed, who are hard pressed and often overworked in an effort to keep the public business up to date.

In the school of nursing some changes in the curriculum were made to better harmonize it with the standard curriculum of nursing. Through affiliation, the subjects of chemistry, psychology, and dietetics are taught at Howard University, for which the students receive college credits. Two entrance periods have been adopted, September and January, and the preliminary term has been extended to six months. This period serves as a probation during which time the faculty may determine whether or not the students are qualified to pursue the work further with profit.

Nineteen nurses were graduated June 2, 1930, at the exercises held in the Andrew Rankin Memorial Chapel, completing 36 years of the school's existence, and having a roll of graduates now numbering 501.

*Receipts and disbursements, 1930***Receipts:**

Appropriation, Interior act—

Salaries -----	\$175, 220. 00
For support -----	84, 960. 00

Total -----	260, 180. 00
Second deficiency act -----	32, 900. 49
From pay patients -----	25, 620. 75
From Howard University -----	32, 682. 52

Total -----	351, 383. 76
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Disbursements:

Miscellaneous (fuel, light, clothing, medicine, etc.) -----	66, 937. 23
From pay patients -----	13, 032. 50
Subsistence -----	49, 291. 74
From pay patients -----	11, 151. 67
Salaries -----	173, 902. 37
Remodeling and enlarging buildings -----	32, 893. 14
Refunds, pay patients -----	618. 50

Total -----	347, 827. 15
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Unexpended balances:

Miscellaneous -----	705. 29
Subsistence -----	708. 26
Salaries -----	1, 317. 63
Pay patients -----	818. 08
Remodeling and enlarging buildings -----	7. 35

Total, unexpended balances -----	3, 556. 61
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HOWARD UNIVERSITY

SUMMARY OF THE PRESIDENT'S REPORT

The Howard University was incorporated by the act of March 2, 1867 (14 Stat. 438). The object of the incorporation named in the first section of the act was "for the education of youth in liberal arts and sciences." It is declared that the incorporators shall be "a body politic and corporate with perpetual succession." The management and control of the institution is vested in a board of not less than 13 trustees; the full board, however, consists of 24 trustees.

Section 8 of the act providing for the incorporation of Howard University, above mentioned, was by act of Congress approved December 13, 1928 (45 Stat. 1021), amended to read as follows:

SEC. 8. Annual appropriations are hereby authorized to aid in the construction, development, improvement, and maintenance of the university, no part of which shall be used for religious instruction. The university shall, at all times, be open to inspection by the Bureau of Education and shall be inspected by said bureau at least once each year. An annual report, making a full exhibit of the affairs of the university, shall be presented to Congress each year in the report of the Bureau of Education.

Students.

The total enrollment of the university for the year 1929-30 was 2,619 students from 38 States (including the District of Columbia) and 18 foreign countries. At the June commencement 325 men and women received degrees in 9 schools and colleges. Twelve of these received the graduate degree of master of arts.

Improvement of instruction.

The increased appropriation of \$65,000 for added personnel, voted by the Congress, enabled the university to take a first and substantial step toward the improvement of instruction at its very foundation by bringing in an increased number of full-time teachers and assistants, while the enrollment was held to a point slightly below that of last year. The immediate effect of this advantage was felt throughout the university.

College of medicine.

There were 315 applicants for admission to the three colleges in the school of medicine. One hundred and six, having maximum preparation, were received. Entering students show a decided in-

crease in the length of their preprofessional education and in the amount and quality of work done in the premedical sciences. A total of 241 students attended the college of medicine this year. Of the 62 students entering the first-year class 42 have bachelor degrees. The quarter system has been inaugurated in the college of medicine, dentistry, and pharmacy in order to integrate the work with undergraduate and graduate instruction. Former President Calvin Coolidge, former Gov. Alfred E. Smith, and Mr. Julius Rosenwald, acting on behalf of the executors of the will of Conrad Hubert, have announced the award of \$250,000 from this estate to Howard University for the development of the school of medicine. Making use of a gift of \$5,000 from the General Education Board, the university has secured an expert survey of its medical-library needs and is making a substantial addition to the number of books. Making further use of moneys provided by the same board, the university has inaugurated a 5-year program for training full-time teachers for the pre-clinical sciences, 5 fellows being sent away this year in the following departments: Anatomy, pathology, physiology, pharmacology, and public health. At the beginning of the year tuition fees were raised from \$200 to \$250 per year. Degrees conferred: M. D., 64. Of the 42 graduates receiving degrees in 1928-29, 40 secured internships.

College of dentistry.

Seventy-four students were enrolled in dentistry this year, a gain of five. Entering students, for the first time, were required to present two years of predental college training. Of the 23 entering, 6 held college degrees and 10 had 3 years of college work. For the first time in its history the college of dentistry operated under the leadership of a full-time dean and an autonomous faculty. Curriculum and faculty were reorganized. Teachers engaged in handling dental subjects are now nearly all full-time men. Decided improvements have been made in the equipment and appearance of laboratories. The board of dental examiners of New York have thoroughly surveyed the work of this college and have voted to register the college in the State of New York. Degrees conferred: D. D. S., 16.

College of pharmacy.

Fifty-four students registered in pharmacy this year. Degrees conferred: Ph. C., 13.

School of law.

Sixty-eight students attended the school of law. The first year's experiment with the full-time 3-year day school proved a success. Twenty students registered for the first-year class. The faculty was strengthened by the addition of a third full-time teacher, and the school has now fully complied with the requirements of the Ameri-

can Association of Law Schools. Only one student registered in the first-year class of the evening school. The trustees have voted to discontinue the evening school at the close of the school year 1929-30 and to concentrate entire attention upon the development of a first-class, full-time day school of law. Degrees conferred: LL. B., 18. Three certificates were awarded.

Undergraduate colleges.

Making use of an appropriation of \$20,795 from the General Education Board and of increased tuition fees, the university was able to effect an increase in the salary scale of the undergraduate colleges.

College of liberal arts.

Eight hundred and fifty-two students were enrolled in 17 departments of instruction in the college of liberal arts. The professional course for the preparation of teachers in physical education, which was inaugurated last year, carried an enrollment of 72 students this year. Twelve teachers were away on furlough for additional graduate work and research. A first expenditure of \$2,400 each in the departments of botany, chemistry, mathematics, physics, and zoology inaugurated a 5-year program to establish and maintain departmental libraries in the natural sciences and mathematics. Degrees conferred, 83, as follows: B. A., 46; B. S., 32; B. S. in commerce, 7.

College of education.

Nine hundred and nineteen students registered in the college of education this year. This is now the largest single group of students enrolled in any college of the university. It reflects the growing demand for competent teachers in negro education throughout the South, now made urgent through the rapid development of high-school enrollment. Four full-time teachers were added to this faculty. Degrees awarded, 93, as follows: A. B. in education, 78; B. S. in education, 15.

College of applied science.

Ninety students enrolled for courses in civil, electrical, and mechanical engineering, architecture, home economics, and art. This college conducted the university cafeteria as a laboratory for institutional management. The faculty was strengthened by the addition of three full-time teachers. The department of art placed on the road its first traveling exhibition of students' work. Through the interest of Mrs. Avery Coonley, of Washington, D. C., a movement was begun which resulted in the completion and opening of a new art gallery on the ground floor of the university chapel. The department of civil engineering has received from Prof. Mary A. Fitch a gift of survey instruments valued at \$500. Seven degrees

were awarded, as follows: B. S. in civil engineering, 3; B. S. in home economics, 2; B. S. in art, 1; B. S. in architecture, 1. All recent graduates of this college are gainfully employed in their chosen or allied fields of work.

School of music.

Sixty-four students enrolled. The course in public-school music passed through its second successful year with an enrollment of 22 students. A new department for children and adult beginners was inaugurated with an enrollment of 15 students. Four musical organizations were conducted. Four graduates received the degree of bachelor of music at commencement.

Graduate school.

During the year there were 52 graduates in residence. Fifteen graduate degrees were awarded as follows: M. A. in education, 3; M. A. in English, 3; M. A. in history, 5; M. A. in mathematics, 2; M. A. in zoology, 2. The demand for graduate work to supply competent teachers for growing negro colleges is greater than the present staff can meet.

Student health.

This year for the first time there was organized a full-time division of student health, with a full-time physician and nurse in charge, residing on the campus and subject to call at all times. All freshmen were examined after entering the university. Periodic examinations were extended as far as possible, and attention was given to general problems of university health.

Reserve Officers' Training Corps.

The professor of military science and tactics reports an enrollment of 365 students in the autumn quarter, 341 in the winter quarter, and 197 in the spring quarter, distributed in the first and second basic and the first and second advanced courses. Twenty-five students were awarded commissions as second lieutenants of Infantry, Officers' Reserve Corps, and two students under 21 years of age were awarded certificates of eligibility.

Summer school.

Four hundred and seventy-eight students from 31 States and 5 foreign countries attended the summer session of 1929. This number was 72 in excess of the total enrollment of 1928 and more than double the enrollment of 1924. Two hundred and twenty-five of these students were actively engaged in teaching, while a large proportion were persons of greater maturity and experience than the students during the other quarters of the year. Twenty-five met

the requirements for graduation at the completion of the summer session; 8 in the college of education; 14 in the college of liberal arts.

Finances.

Howard University was incorporated in 1867, but no appropriation was made for its support by Congress until March 3, 1879, when the sum of \$10,000 was appropriated for maintenance. Since that time Congress has made annual appropriations for the institution, expendable under the supervision of the Secretary of the Interior, who is patron ex officio of the board of trustees. The president of the university reports that during the year private philanthropy announced appropriations to Howard University of \$535,000, in varying amounts, for current expense, to be used for the most part in 1930-31 in current development and capital expenditures.

Property.

The report of the secretary-treasurer covers receipts from all sources, including the Federal appropriations, tuitions and other fees, endowments and other investments, rents, donations, etc. The total income for 1930 from all sources was \$915,764.02, and the total expenditures were \$880,030.29. For the fourth consecutive time there is no current deficit. On the contrary, economical administration has secured a sum of \$38,683.73, to be applied toward retiring the accumulated deficit. The total assets on June 30, 1930, were \$5,061,277.65; \$845,309.68 of trust funds were invested in mortgages and other securities; and \$749,039.82 represented a physical plant extension fund. The balance consisted of \$152,790.64, assets of general fund; \$60,585.51, unproductive land; \$6,871.71, cash in bank; and \$3,246,680.29, educational plant, including \$546,464.08, unexpended balance of the appropriation from Congress for the women's dormitory and chemistry building. The property of the university has been accumulated mainly through donations and the sale of and the increase in value of 128 acres of land originally purchased and subdivided by it.

COLUMBIA INSTITUTION FOR THE DEAF

SUMMARY OF THE PRESIDENT'S REPORT

This institution was established by act of February 16, 1857 (11 Stats. 161). It is managed by a board of directors, on which Congress is represented by one Senator and two Representatives, and is supported mainly by congressional appropriation and in part by tuition fees, etc. The admission to the institution of indigent beneficiaries from the States and Territories is subject to the approval of the Secretary of the Interior, and the latter was, up to and including June 30, 1898, charged with the supervision of the expenditure of congressional appropriations. The sundry civil appropriation act, however, which was approved July 1, 1898, transferred to the directors of the institution the control of all disbursements of moneys appropriated by Congress for its benefit.

During the year July 1, 1929, through June 30, 1930, there were under instruction in the advanced department of the institution, known as Gallaudet College, 76 men and 55 women, a total of 131, representing 35 States, the District of Columbia, and Canada. In the primary and grammar department, known as Kendall School, there were under instruction 41 boys and 23 girls, a total of 64. Of the total number in this department 59 were admitted as beneficiaries of the District of Columbia.

Unusually good health conditions prevailed during the year. The custom of keeping weight charts of all pupils and students was continued and these charts were studied from time to time in order to know when special diet should be given in any particular case. A dental infirmary was operated as usual and the benefits, particularly to young children, were marked. More playground equipment was purchased for the younger children. Indoor baseball, basketball, tennis, golf, swimming, baseball, track meets, and football were promoted, and served to maintain excellent health and spirits among the students, and courses in analytic geometry and strength of materials were added for the benefit of students working at architectural drawing. Equipment and instructors for additional courses in business practice and drawing have been provided. Among the pursuits of the graduates were printing, carpentry work, repairing, window cleaning, engraving, sculpture, etc., and an inquiry sent out as to the occupations of pupils of the advanced department showed a wide

range, such as architectural work, agriculture, accountancy, automobile manufacture and repairs, real estate, banking, chemistry, dentistry, engraving, etc.

The institution is in need of a modern building for library instruction and other purposes, to which attention has been called in prior reports. Equipment for the teaching of business practice, and funds for the expansion of the library should be provided for in the near future.

On commencement day, Tuesday, June 10, 1930, the honorary degree of master of arts was conferred on two deaf men. The degree of master of arts in the normal department was granted to 5 students, bachelor of arts in the normal department to 1, the bachelor of arts in course to 11 students, and that of bachelor of science in course to 9 students.

The bank balance and the working fund on hand July 1, 1929, was \$109,671. The receipts during the year were \$163,015.11, a grand total of \$164,111.82. The total expenditures during the year were \$160,782.66.

EXTRA-DEPARTMENTAL ACTIVITIES

AMERICAN ANTIQUITIES

SUMMARY OF THE DEPARTMENT ARCHEOLOGIST'S REPORT

The act of June 8, 1906, entitled "An act for the preservation of American antiquities," provides, among other things:

SEC. 3. That permits for the examination of ruins, the excavation of archeological sites, and the gathering of objects of antiquity upon the lands under their respective jurisdiction may be granted by the Secretaries of the Interior, Agriculture, and War to institutions which they may deem properly qualified to conduct such examination, excavation, or gathering, subject to such rules and regulations as they may prescribe: *Provided*, That the examinations, excavations, and gatherings are undertaken for the benefit of reputable museums, universities, colleges, or other recognized scientific or educational institutions, with a view to increasing the knowledge of such objects, and that the gatherings shall be made for permanent preservation in public museums.

SEC. 4. That the secretaries of the departments aforesaid shall make and publish from time to time uniform rules and regulations for the purpose of carrying out the provisions of this Act.

Archeological explorations.

The uniform rules and regulations promulgated by the Secretaries of the Interior, Agriculture, and War, pursuant to the above-mentioned act, under date of December 28, 1906, provides (par. 3) that—

Permits for the excavation of ruins, the excavation of archeological sites, and the gathering of objects of antiquity will be granted by the respective secretaries having jurisdiction to reputable museums, universities, colleges, or other recognized scientific or educational institutions, or to their duly authorized agents.

Under the provisions of the above act, the department archeologist, Mr. Jesse L. Nusbaum, who is also superintendent of the Mesa Verde National Park, renders advisory service to all branches of the department, as well as to scientific and educational institutions contemplating archeological investigation upon the public domain under the jurisdiction of the department. This official is also engaged in developing methods for the better protection of the many archeological sites located mainly throughout the Southwest; the prevention of unlawful excavation of these sites; the orderly

conduct of work authorized by department permits, and the proper publication of the scientific information derived therefrom.

Permits granted.

During the year 21 permits were granted for the examination, excavation, and gathering of archeological specimens. A complete list is published in the archeologist's report.

In submitting his report upon the work of the past year, the department archeologist states that more expeditions have been operating in the archeological fields of the Southwest during the season than ever before in history. He reports that there is a rapidly growing interest in this field of research, which is being aided greatly by various scientific and educational institutions of the country in providing improved field facilities for their representatives and field training courses in anthropologic methods for graduate students. With this growing interest, however, it is pointed out that there is even greater danger than before of ancient ruins being despoiled by the pot hunter, the curio seeker, and the vandal. In order to correct this condition he repeats in effect his recommendations of the previous year as follows:

That efforts be made to educate the public to a proper appreciation of the value of scientific investigations by qualified institutions as contrasted with the destructive work of the curio seeker and vandal; that all field employees, particularly in the Southwest, be made familiar with the "Act for the protection of American antiquities," and impressed with the importance of strictly enforcing this act and the prompt reporting to proper authorities of any violations thereof; That Government field heads be authorized to arrest persons who appropriate, excavate, injure or destroy prehistoric ruins or monuments on lands under the supervision of the department, and to seize any objects of antiquity unlawfully collected for deposit in the proper national depository; and Indian traders and others operating stores and trading posts on lands of the department under permit be prohibited from purchasing, bartering, or exposing for sale, archeological materials or objects of antiquity under penalty of revocation of license.

GENERAL EDUCATION BOARD

SUMMARY OF THE CORPORATION'S REPORT

This corporation, which was created by an act of Congress approved January 12, 1903, section 6 of which requires the corporation to annually file with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation, and the expenditure or other use or disposition of the same or the income thereof during the preceding year, has for its object the promotion of education within the United States.

On June 30, 1930, the principal funds, belonging without restriction to the board, amounted to \$53,731,648.87. This is invested in stocks, bonds, and secured demand loans. In addition, the sum of \$26,748,705.87 is reserved to pay appropriations to various educational institutions, including \$8,402,000 appropriated during the year ending June 30, 1930. This fund is also invested in stocks, bonds, and secured demand loans. As prior years' appropriations in the sum of \$473,593.01 were lapsed during the year, the net increase in appropriations from principal was \$7,928,406.99. The sum of \$22,468,815.80 was paid during the year ending June 30, 1930.

Appropriations from income during the year aggregated \$8,028,041.35. Lapses on account of prior years' appropriations amounted to \$535,851.08, however, leaving a net increase in income appropriations of \$7,492,190.27.

The income from the above funds, together with the income from undisbursed income, amounted during the year to \$6,217,809.40. The balance of income from the previous year as of June 30, 1929, amounting to \$14,367,364.79, together with sundry refunds amounting to \$270.04, increased the total to \$20,585,444.23.

Disbursements from income during the year were as follows:

For whites:

American Journal of Pathology-----	\$7, 500. 00
Universities and colleges—	
Endowment and general purposes-----	2, 721, 647. 90
To increase teachers' salaries-----	18, 276. 04
County school consolidation-----	296. 53
Fellowships-----	31, 867. 00
Humanities-----	931, 135. 61
Industrial art-----	283, 714. 10
Lincoln School-----	45, 890. 41
Medical schools-----	1, 260, 230. 74

For whites—Continued.

National Academy of Sciences.....	\$15,256.39
National Research Council.....	9,375.00
Public education colleges.....	211,347.60
Rural school agents.....	8,771.32
State departments of education—Divisions of information and statistics, schoolhouse planning and construction, school libraries, etc.....	111,502.86
Study of learned publications in the United States.....	7,928.18
Traveling professors.....	3,500.00

For negroes:

Anna T. Jeanes foundation.....	76,750.00
Colleges and schools—	
Endowment and general purposes.....	1,119,832.11
To increase teachers' salaries.....	4,733.61
Division of negro education.....	4,000.00
Equipment for negro schools.....	5,000.00
Expenses of special students at summer schools.....	4,273.00
Fellowships.....	41,850.00
John F. Slater fund.....	90,525.00
Medical schools.....	127,789.40
National Research Council fellowship.....	2,500.00
Rural school agents.....	83,433.53
Summer schools.....	14,830.74
Training negro teachers in Arkansas high schools.....	6,000.00

Miscellaneous:

Conferences.....	7,785.95
Fund for miscellaneous items.....	1,510.26
Improvement of accounting systems in educational institutions.....	2,549.51
Rural school supervision.....	30,763.98
Short-term fellowships.....	5,750.00
Studies in the field of public education.....	20,255.40
Administration.....	234,839.19

7,553,211.36

This leaves an undisbursed balance of income on June 30, 1930, of \$13,032,232.87, which is invested as follows: Cash on deposit, \$180,955.32; secured demand loans, \$12,174,992.05; accounts receivable, net, \$676,285.50. It should be noted, however, that against this balance there are unpaid appropriations amounting to \$13,243,281.42, leaving appropriations in excess of available income amounting to \$211,048.55.

The Anna T. Jeanes fund, the income of which is to be used for negro rural schools, amounts to \$206,084.16. It is invested as follows: Bonds, \$109,289.16; stocks, \$16,645; secured demand loans, \$80,150. The income from this fund during the year was \$9,637.09. Added to the balance from the previous year, the total available income amounted to \$14,862.09. Of this \$8,430.63 was appropriated and paid to various schools, leaving a balance of \$6,431.46 accounted for in secured demand loans.

FUEL ADMINISTRATION AND BITUMINOUS COAL COMMISSION RECORDS

The records of the Fuel Administration and the Bituminous Coal Commission were transferred to the custody of the Secretary of the Interior under Executive orders of July 22, 1919, March 24, 1920, and June 16, 1920, and numerous requests for information therefrom and for certified copies of such records have been received. Under date of June 27, 1928, a committee was designated by the Secretary of the Interior to make careful examination of the records and files of the Fuel Administration with a view to submitting the report to Congress to determine whether any of the same could be destroyed. The report of this committee which was submitted to Congress February 13, 1929, under the act of February 16, 1889 (25 Stat. 672), recommended that a very large number of the Fuel Administration records be destroyed as having no permanent value, nor being of historical interest, and recommended that the files of the Bituminous Coal Commission be kept intact. Thereafter, under date of March 30, 1930, Congress approved the report of the committee above mentioned, authorizing the destruction of the papers of the Fuel Administration, and under date of August 30, 1930, the department submitted a report to the chairman of the Committee on the Disposition of Useless Executive Papers, stating that the records in question weighed 31,824 pounds, that they had been mutilated and turned over to the contractor for the purchase of waste paper, by the group superintendent of the Office of Public Buildings and Public Parks of the National Capital, and that there was received therefor the sum of \$112.98. The remainder of the records in question were removed in February of 1930 from Temporary Building No. 4, Twentieth Street and Virginia Avenue NW., to the basement of the Southern Railway Building, at the corner of Thirteenth Street and Pennsylvania Avenue NW., where they now remain.

THE PERRY'S VICTORY MEMORIAL COMMISSION

SUMMARY OF THE COMMISSION'S REPORT

As required by "An act creating a commission for the maintenance, control, care, and so forth of the Perry's Victory Memorial on Put in Bay Island, Lake Erie, Ohio, and for other purposes," approved March 3, 1919 (40 Stat. 1322), the ninth annual report of this commission to the Secretary of the Interior for the year ended December 1, 1928, indicated "the condition of the site and memorial as to preservation," and contained a detailed statement of "all receipts and disbursements of money pertaining thereto."

Certain changes in the officers of the commission were effected at its annual meeting, September 10, 1929, the officers then elected for the ensuing year being as follows: President, Webster P. Huntington, Columbus, Ohio; vice president, Charles B. Perry, Milwaukee, Wis.; secretary, Richard S. Folsom, Chicago, Ill.; treasurer, William Schnoor, Put in Bay, Ohio; auditor, Sumner Mowry, Peace Dale, R. I.

The physical condition of the memorial property, including the grounds of 14 acres and the improvements made during the year by the installation of the new flood-lighting system and construction of the utility building authorized by Congress, is described as most satisfactory.

The season of operation, from May 30 to December 10 during the year, was reported as financially the least favorable since the Government took over the memorial in 1919, this fact being attributed to cold weather, high lake levels and severe storms affecting summer resort patronage throughout the Great Lakes region. However, receipts for the season were sufficient to enable the memorial to remain self-supporting. The cash balance reported on hand December 1, 1928, was \$1,528.05. The total receipts for the year ending December 1, 1929, were \$7,829.24, and the total disbursements \$8,103.66, leaving a cash balance from the total amount available at the time of filing the report of \$1,253.63.

Expenses for the year ending December 1, 1929, were \$274.42 in excess of receipts. However, during the period of the report the commission expended from earnings, in permanent improvements, \$205.60 for winter protection for flood lights and \$115 for a cashier's desk in the rotunda of the memorial; and for other extraordinary

purposes \$519.65 in full payment of the cost of printing 10,000 souvenir booklets, from the sale of which certain revenue is annually derived, and \$401.61 on account of expenses of the committee on disbursement of the Federal appropriation; a total of \$1,241.86. On the basis of normal operation, therefore, the year covered by the report witnessed the continued earning power of the memorial, over a period of 15 years since opened to the public, as a self-sustaining institution.

Concerning expenditure of the appropriation of \$14,374 by the Seventieth Congress (second deficiency bill, first session) to provide for the proper electric lighting of the memorial plazas and grounds and the construction of a utility building on the grounds for use as a public comfort station and for the storage of tools, implements, etc., used in operation of the memorial, the report sets forth that the contracts for these purposes, \$7,200 for flood-lighting equipment, \$6,855 for utility building and \$140 for architect's fee, a total of \$14,195, were duly performed and accepted, leaving \$179 from the amount appropriated to revert to the United States Treasury.

The commission for the second time urges upon the Government the advisability of an investigation to ascertain the possibilities of the flood-lighted memorial as an aid to navigation during the season of navigation on the Great Lakes and to aviation the year round. It is stated that the revenues from operation of the memorial can never be expected to meet the sustained cost of flood lighting for these purposes and that the advantageous location of the memorial for both purposes should interest the Government in utilization of it for both at Government expense.

In an informal supplementary report under date of September 15, 1930, anticipating the detailed report required to be filed December 1, next, the commission states that the revenues from operation of the memorial suffered a serious decline during the summer of 1930 but were sufficient to pay normal charges of actual operation except for flood lighting. A portion of the expense on the latter account will have to be carried over to the next season, the amount depending upon other necessary expenses up to December 1, 1930.

The full report of this commission, when received, will be forwarded to the President for consideration, with a view to its transmission to Congress.

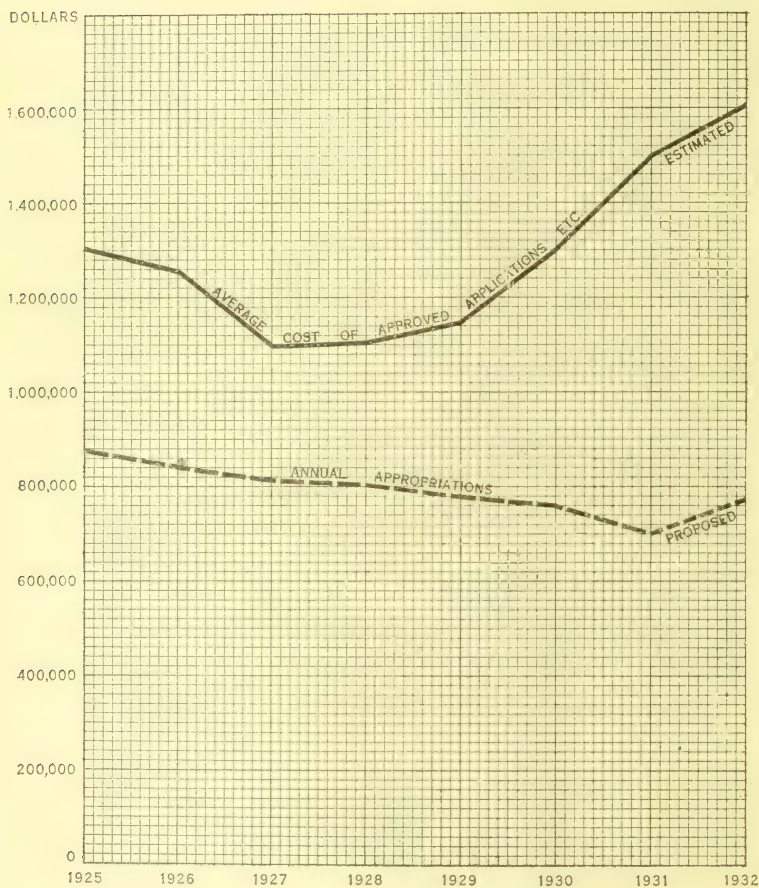
New wells and wells shut in in major oil-producing public-land States

	Number of wells completed to production on public lands				Number of wells completed to production on all lands			Number of wells shut in on public lands as of—		Number of wells shut in on all lands as of—		Number of oil and gas permits under supervision as of—		
	1927	1928	1929	Jan. 1-July 1, 1930	1927	1928	1929	Jan. 1-July 1, 1930	Mar. 12, 1929	July 1, 1930	Mar. 12, 1929	Jan. 1, 1927	Mar. 1, 1929	July 1, 1930
Wyoming-----	179	91	91	27	249	138	134	41	159	204	417	4,581	4,049	1,471
Utah-----	7	6	0	0	18	10	9	5	6	9	15	3,969	3,014	1,579
Idaho-----	0	0	0	0	1	0	0	0	0	0	3	2,179	363	122
Colorado-----	9	5	4	2	34	55	35	6	4	2	8	2,811	2,696	507
Montana-----	22	21	24	11	270	283	292	53	22	40	95	3,012	1,672	570
New Mexico-----	16	11	27	10	31	19	42	38	5	33	17	3,092	4,184	1,326
California-----	67	50	63	23	877	688	874	369	270	311	3,560	2,664	1,453	519
Total-----	300	184	209	73	1,480	1,193	1,386	512	466	599	4,115	20,308	17,431	5,094

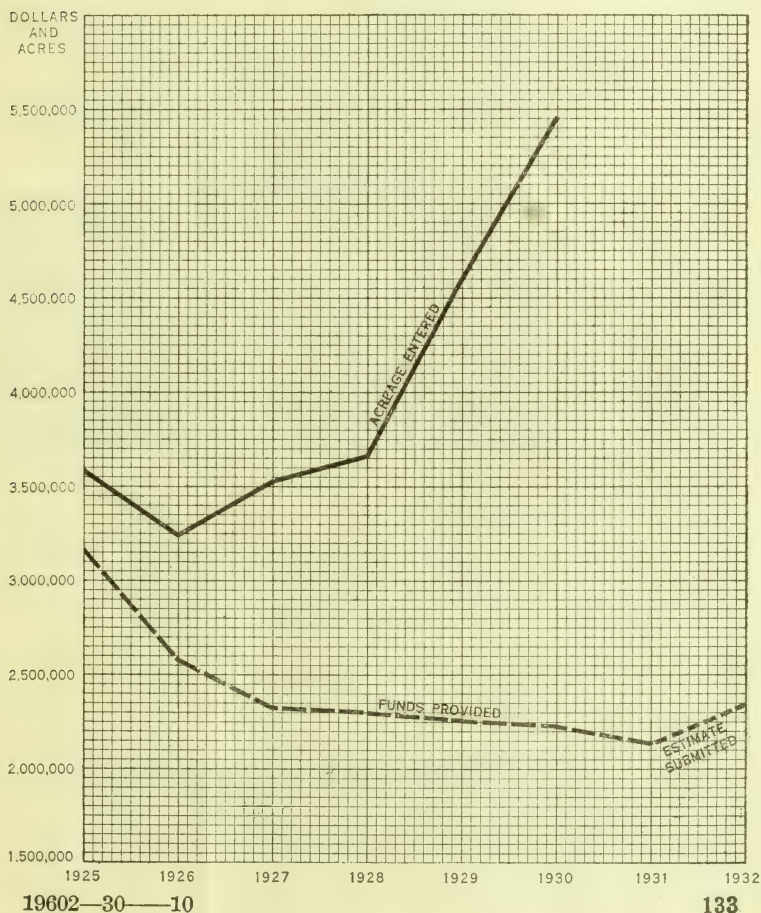
NOTE.—Naval reserves not included.

CHARTS

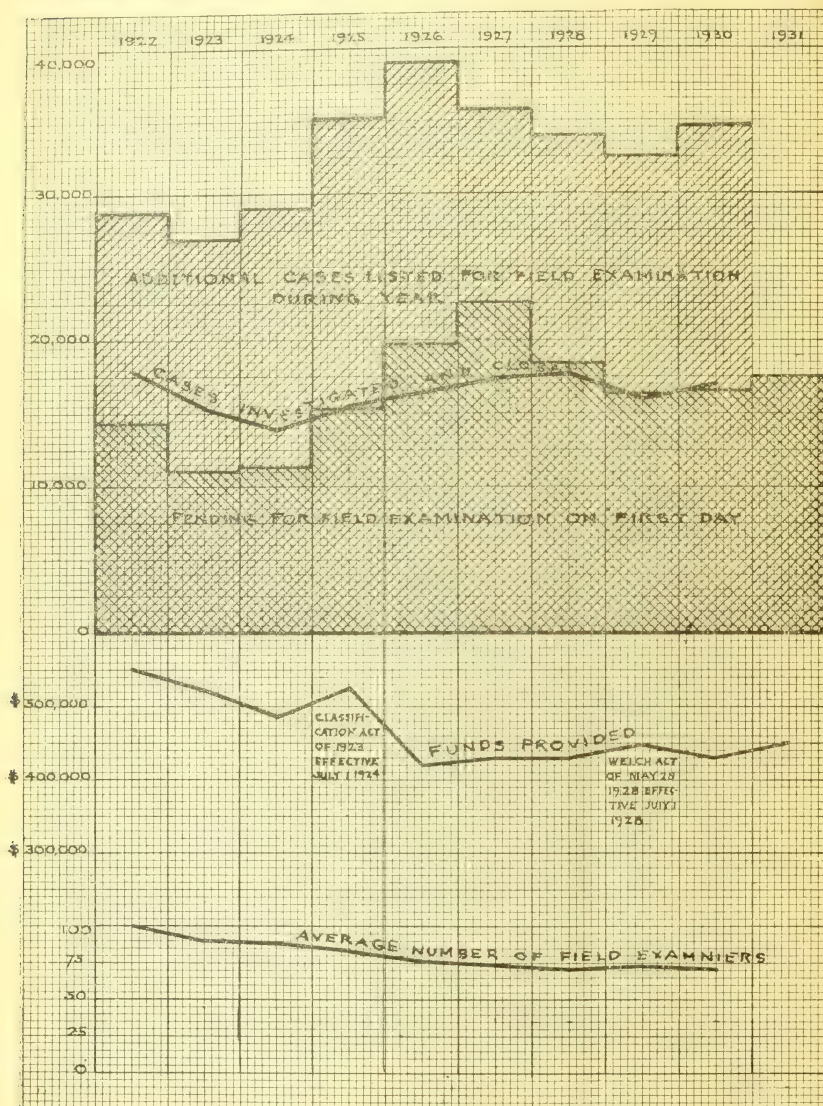
AVERAGE COST OF APPROVED APPLICATIONS AND PETITIONS FOR SURVEYS AND RESURVEYS (SURVEYS AUTHORIZED)

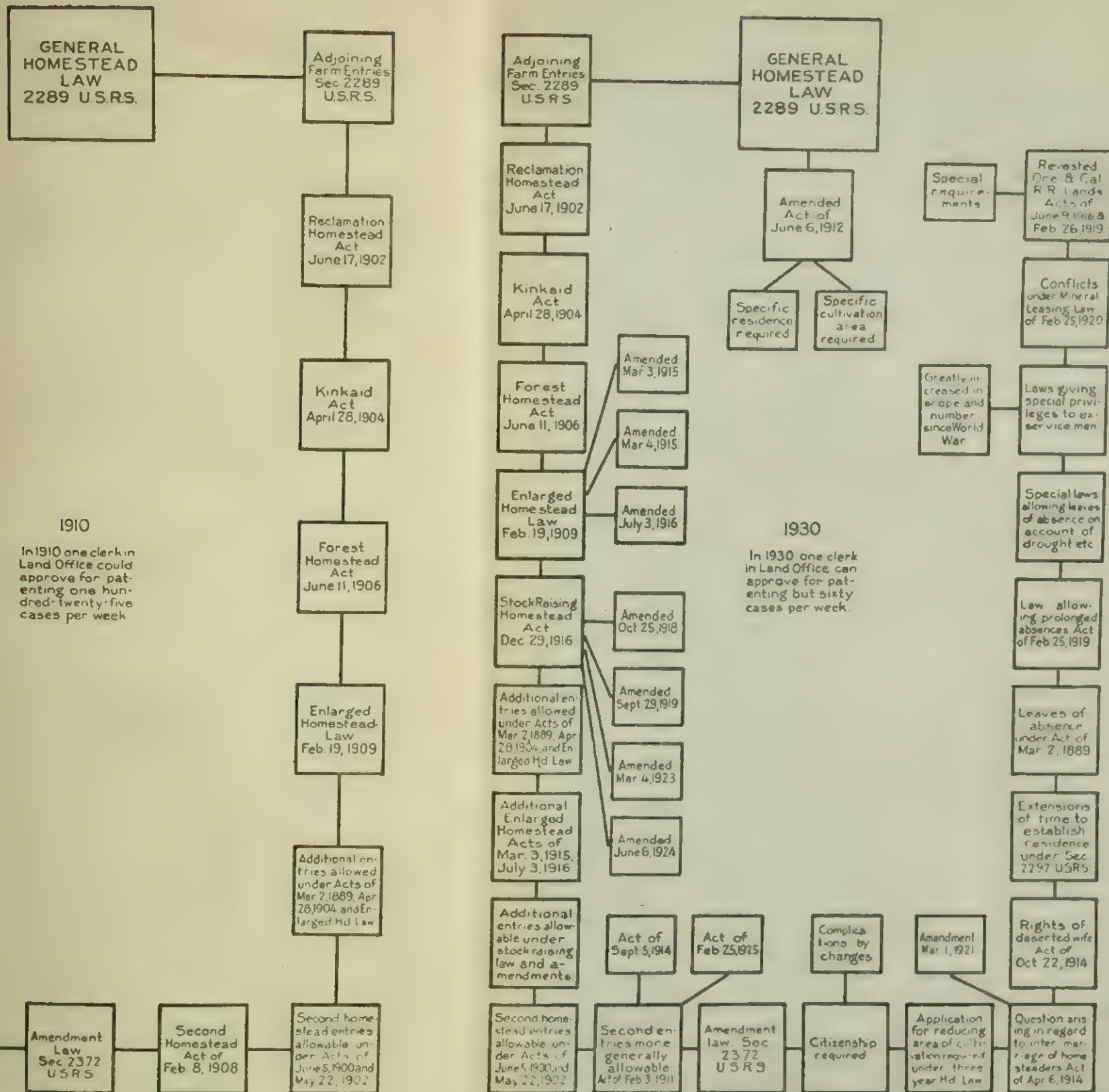


DECLINE IN FUNDS PROVIDED FOR G. L. O. FOR ALL PURPOSES
AND INCREASE IN ACREAGE OF PUBLIC LAND ENTERED, 1925 TO 1930

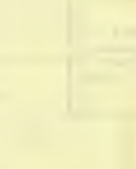
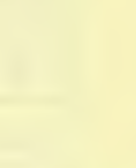
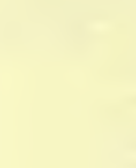
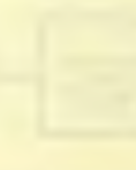
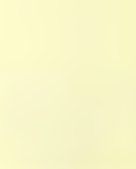
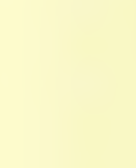
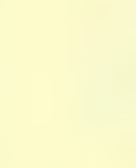
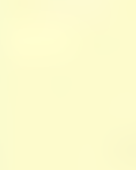


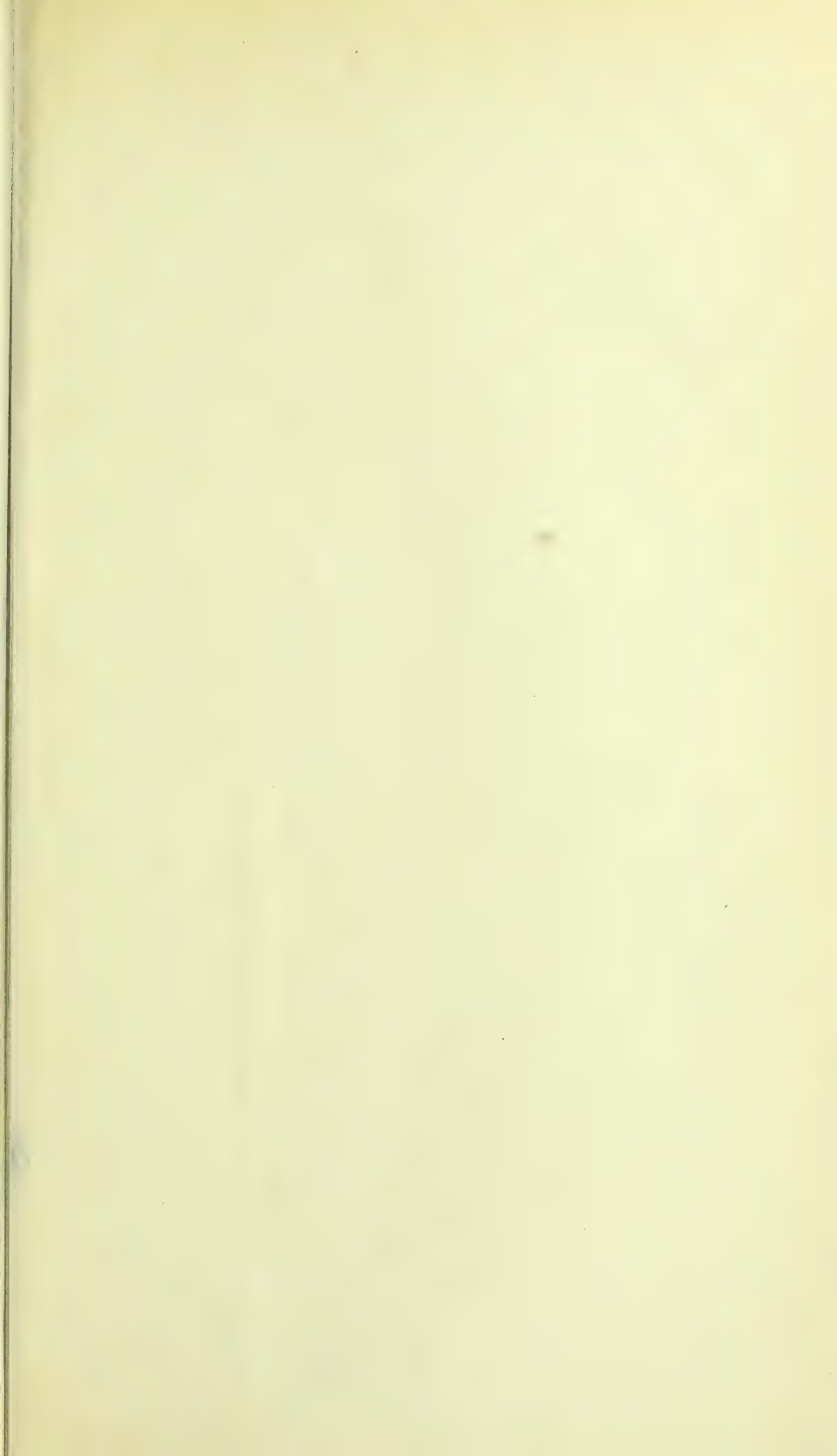
Cases received for investigation in the Field Service, General Land Office, number handled, appropriations, and number of field examiners, by fiscal years, 1922 to 1931.





COMPARISON OF LAND OFFICE DUTIES IN EFFECTING HOMESTEADS 1910 AND 1930





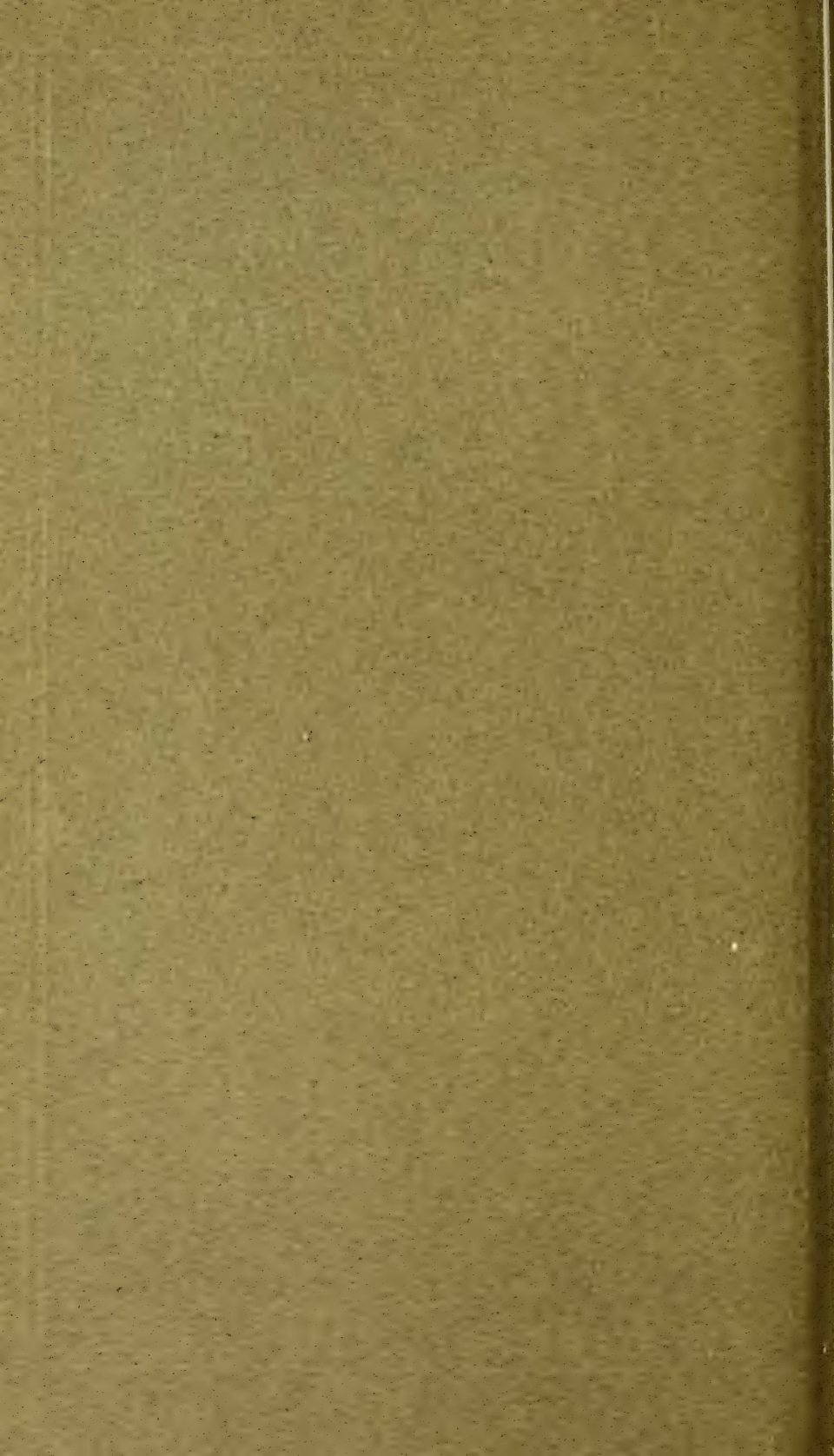


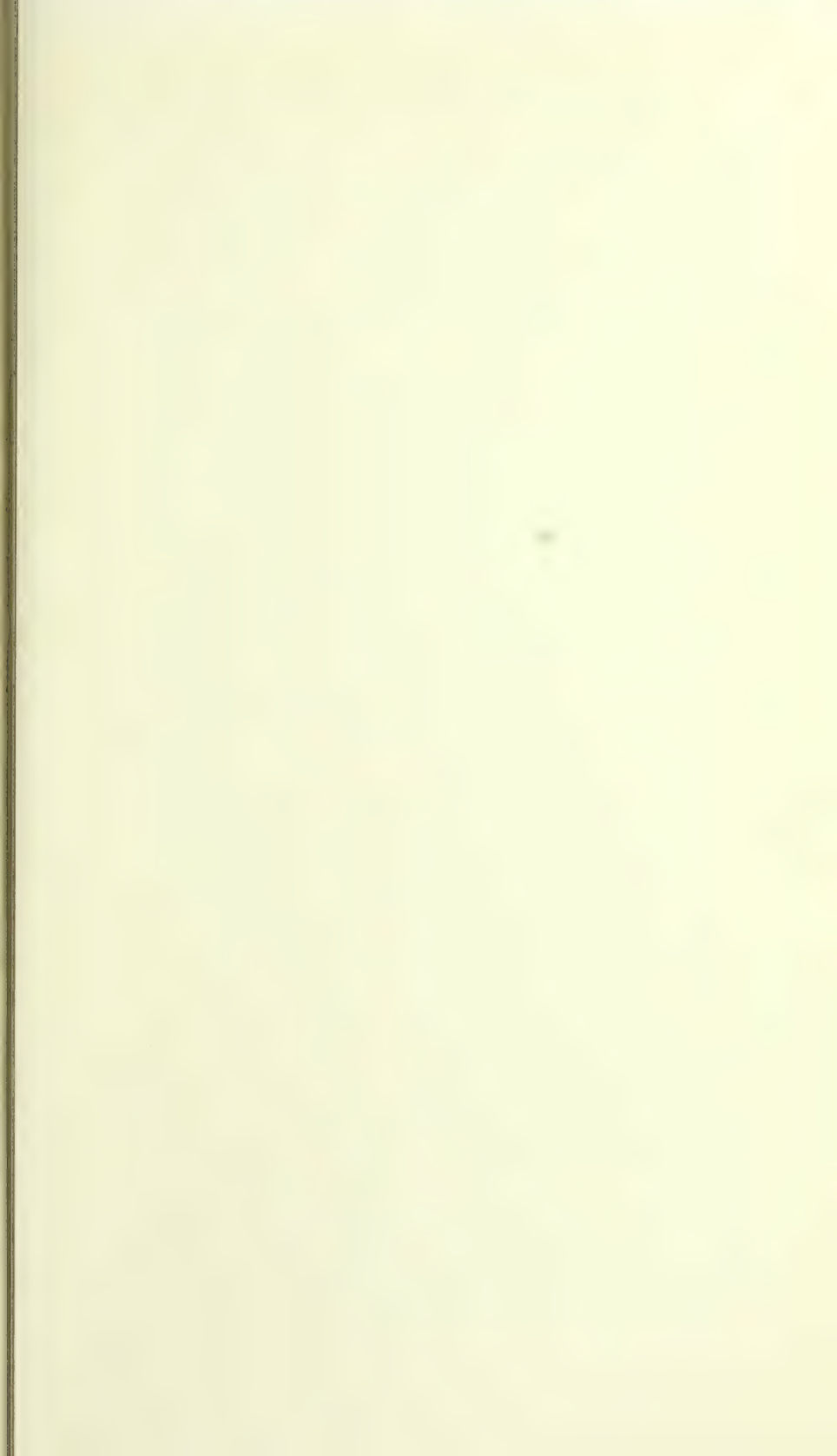


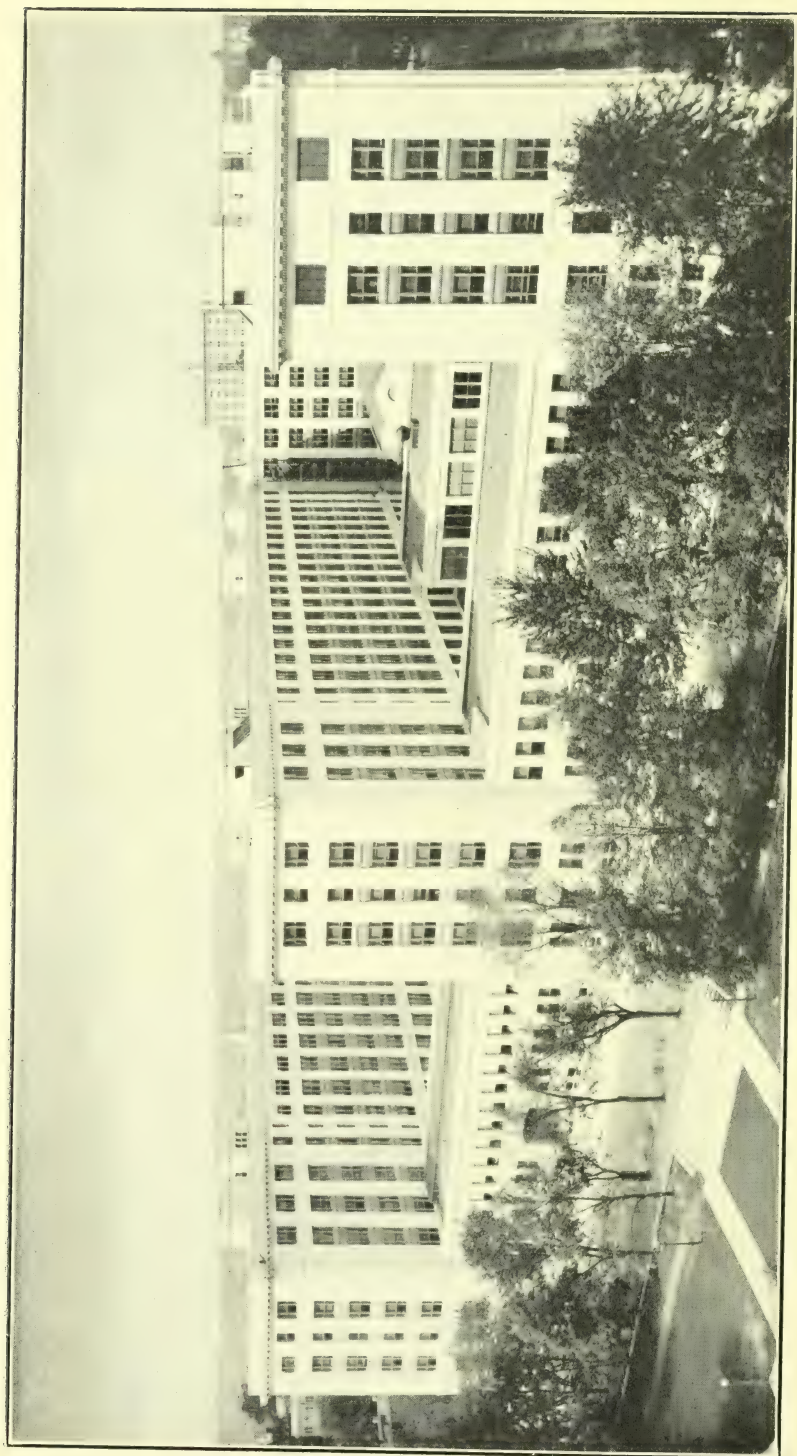
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ANNUAL REPORT
of the SECRETARY
OF THE INTERIOR

for the FISCAL YEAR ENDED 1931
JUNE 30







INTERIOR DEPARTMENT BUILDING

ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR

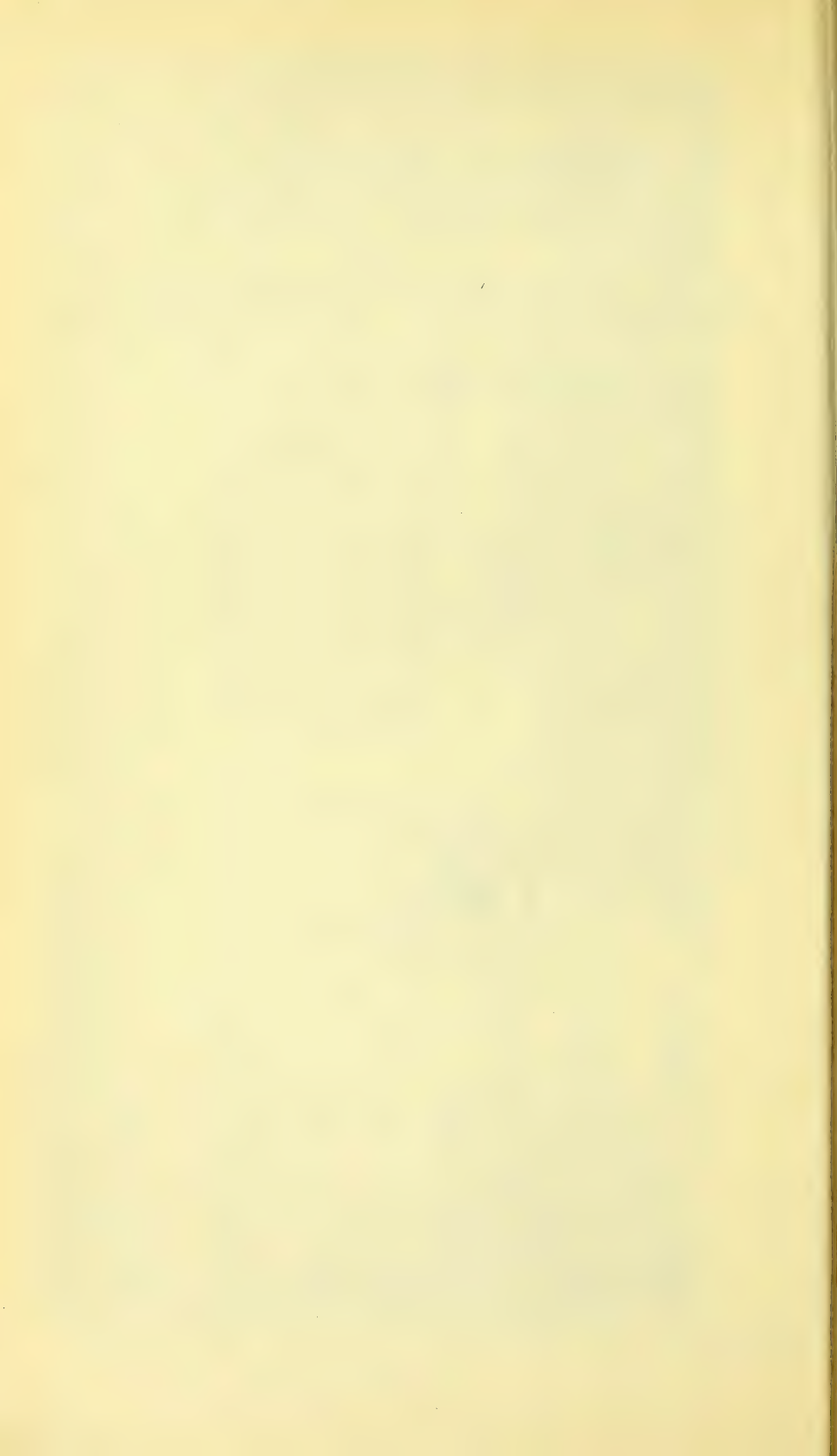


FOR THE FISCAL YEAR ENDED JUNE 30

1931



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1931



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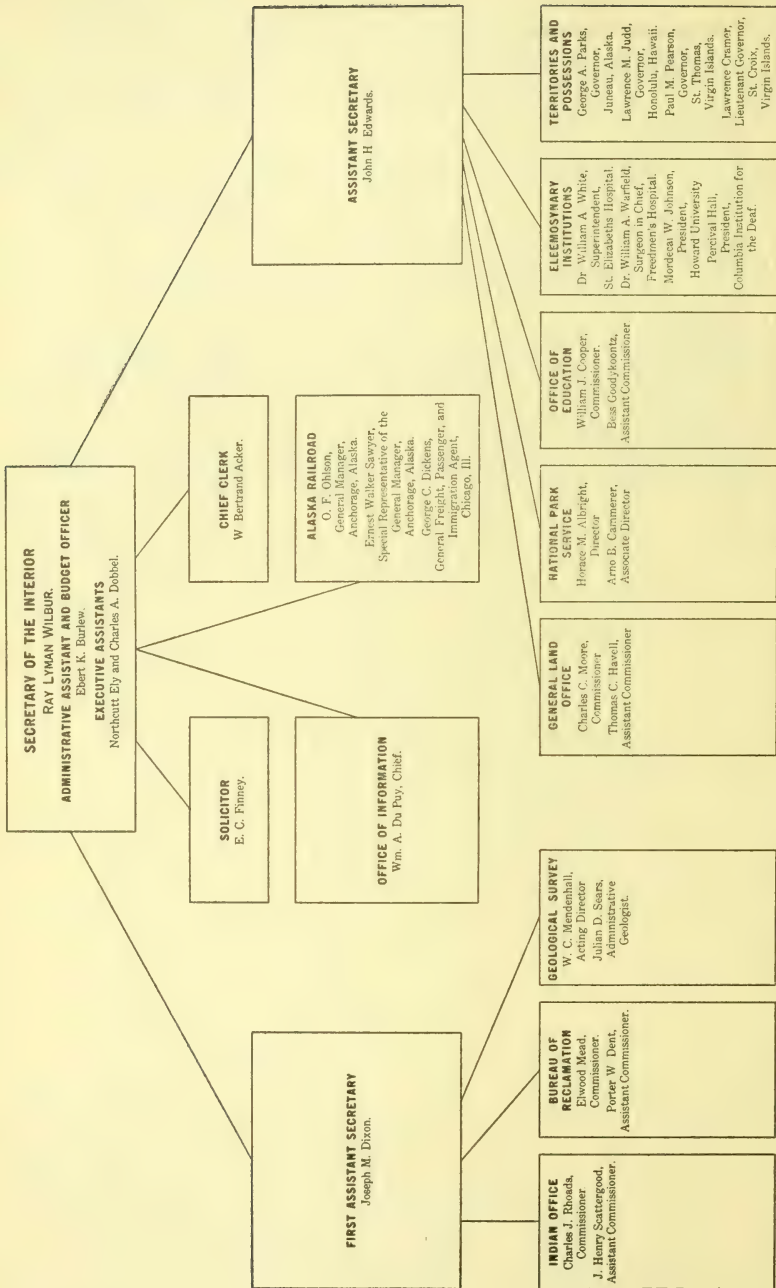
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DEPARTMENT OF THE INTERIOR



ORGANIZATION CHART

October 15, 1931.

OFFICERS OF DEPARTMENT OF THE INTERIOR

Office of the Secretary:

<i>Secretary of the Interior</i> -----	RAY LYMAN WILBUR.
<i>First Assistant Secretary</i> -----	JOSEPH M. DIXON.
<i>Assistant Secretary</i> -----	JOHN H. EDWARDS.
<i>Administrative Assistant</i> -----	EBERT K. BURLEW.
<i>Executive Assistant</i> -----	CHAS. A. DOBBEL.
<i>Executive Assistant</i> -----	NORTHCUTT ELY.
<i>Assistant Administrative Officer</i> -----	GEORGE E. SCOTT.
<i>Chief Clerk of the Department</i> -----	WM. BERTRAND ACKER.

Office of the Solicitor:

<i>Solicitor</i> -----	EDWARD C. FINNEY.
<i>Assistant to the Solicitor</i> -----	ORLIN H. GRAVES.
<i>Member, Board of Appeals</i> -----	ALVAH W. PATTERSON.
<i>Member, Board of Appeals</i> -----	JOHN P. McDOWELL.
<i>Member, Board of Appeals</i> -----	JOHN H. THOMAS.

The Bureaus:

<i>Commissioner of the General Land Office</i> ----	CHARLES C. MOORE.
<i>Assistant Commissioner, General Land Office</i> ---	THOMAS C. HAVELL.
<i>Commissioner of Indian Affairs</i> -----	CHARLES J. RHOADS.
<i>Assistant Commissioner of Indian Affairs</i> ---	J. HENRY SCATTERGOOD.
<i>Commissioner of Education</i> -----	WM. JOHN COOPER.
<i>Assistant Commissioner of Education</i> -----	MISS BESS GOODYKOONTZ.
<i>Acting Director of the Geological Survey</i> ----	WALTER C. MENDENHALL.
<i>Administrative Geologist</i> -----	J. D. SEARS.
<i>Commissioner of Reclamation</i> -----	ELWOOD MEAD.
<i>Assistant Commissioner of Reclamation</i> -----	PORTER W. DENT.
<i>Director of the National Park Service</i> -----	HORACE M. ALBRIGHT.
<i>Associate Director, National Park Service</i> ---	ARNO B. CAMMERER.

The Territories and Possessions:

<i>Governor of Hawaii</i> -----	LAWRENCE M. JUDD.
<i>Governor of Alaska</i> -----	GEORGE A. PARKS.
<i>Governor of the Virgin Islands</i> -----	PAUL M. PEARSON.
<i>General Manager, the Alaska Railroad</i> -----	OTTO F. OHLSON.

Institutions:

<i>Superintendent, St. Elizabeths Hospital</i> -----	Dr. WILLIAM A. WHITE.
<i>Surgeon-in-chief, Freedmen's Hospital</i> -----	Dr. WILLIAM A. WARFIELD.
<i>President, Howard University</i> -----	MORDECAI W. JOHNSON.
<i>President, Columbia Institution for the Deaf</i> ---	Dr. PERCIVAL HALL.

FUNCTIONS OF THE DEPARTMENT OF THE INTERIOR

The United States Department of the Interior, established by the act of March 3, 1849 (9 Stat. 395), is the land, home, and education department of the Government. Its work is a permanent contribution to the educational, scientific, historical, and conservation functions of the Government. It is a fact-finding department for internal development. Its mission is largely educational and many of its activities are devoted to the discovery and dissemination of knowledge.

GENERAL LAND OFFICE.—Originally organized as a bureau of the Treasury Department under the act of April 25, 1812 (2 Stat. 716), and transferred to the Interior Department in 1849, the General Land Office has control of the public lands, including their survey, handling applications for homesteads and Indian allotments, desert land and mining claims, and mineral leases. Has jurisdiction over granting railroad and other rights of way and easements on public lands and adjusting State and railroad land grants.

OFFICE OF INDIAN AFFAIRS.—Originally organized as a bureau of the War Department under the act of July 9, 1832 (4 Stat. 564), and transferred to the Interior Department in 1849. Acts as the official guardian of the Indians; promotes their health and physical welfare; directs the education of Indian children; encourages their native arts and crafts; reclaims their lands and develops the national resources in timber and minerals; supervises their funds; adjusts heirship matters and handles all Indian affairs of the Government.

OFFICE OF EDUCATION.—Established as a department under the act of March 2, 1867 (14 Stat. 434), and became a bureau of the Interior Department in 1869 (15 Stat. 106). Furthers education by the compilation and dissemination of data covering education in the United States and foreign countries; conducts university, college, and school surveys, including experiments in education; operates Government schools for the natives of Alaska.

GEOLOGICAL SURVEY.—Established under the act of March 3, 1879 (20 Stat. 394). Makes topographic and geological maps of the United States and Alaska; studies the surface and underground water resources; prepares and distributes reports on gold, silver, petroleum, and other mineral deposits; and, through a conservation branch, classifies public lands and supervises engineering phases of mineral leasing.

BUREAU OF RECLAMATION.—Established under the act of June 17, 1902 (32 Stat. 388), for the purpose of developing agricultural possibilities of the arid and semiarid regions of the United States. This bureau constructs and operates irrigation works; collects annual payments from water users for cost of irrigation; promotes knowledge of irrigation methods, suitability of crops, availability of markets, and improvement of farm homes.

NATIONAL PARK SERVICE.—Established by the act of August 25, 1916 (39 Stat. 535), this bureau conserves the natural beauties and unique characteristics of the national parks and monuments under its control and promotes their use for the health and recreation of the people. It also protects and restores ruins of ancient civilization and the flora and fauna of the parks.

ALASKA RAILROAD.—Construction authorized by Congress under the act of March 12, 1914 (38 Stat. 305), and completed in 1923 at a cost of \$60,000,000. This Government owned and operated road extends for a distance of 467 miles into the interior of Alaska, transporting passengers, freight, express, and mail.

ST. ELIZABETHS HOSPITAL.—Established under the act of March 3, 1855 (10 Stat. 682), this is a class A institution for the treatment of mental diseases of the Army, Navy, and District of Columbia.

FREEDMEN'S HOSPITAL.—Established under the control of the War Department by act of March 3, 1871 (16 Stat. 506), and transferred to Interior Department by act of June 23, 1874 (18 Stat. 223). This hospital provides medical and surgical treatment for the colored race, its patients including indigent residents of the District of Columbia, residents of the several States, emergency cases, and regular pay patients.

HOWARD UNIVERSITY.—Established by the act of March 2, 1867 (14 Stat. 438), this is an institution of higher education of the colored youth of the Nation in liberal arts and sciences, medicine, law, and religion.¹

COLUMBIA INSTITUTION FOR THE DEAF.—Established under the act of February 16, 1857 (11 Stat. 161). This institution cares for deaf-mutes of the States and Territories and the District of Columbia. It reports annually to the Secretary of the Interior and certain of its beneficiaries are admitted to the institution under that officer.

The territories of Alaska and Hawaii are directly represented by the Secretary of the Interior in the official family of the President, many of various Federal activities in these Territories being under his supervision.

The government of the Virgin Islands was by Executive order dated February 27, 1931, placed under the supervision of the Secretary of the Interior.

¹ Amended by the act of December 13, 1928 (45 Stat. 1029), so as to authorize appropriations by Congress and providing for the institution being opened to inspection by the Bureau of Education.

SERVICE OF SECRETARIES OF THE INTERIOR

Name	When appointed	Whence appointed	President	Length of service
				<i>Yrs. mos. days</i>
1. Thomas Ewing.....	Mar. 8, 1849	Ohio.....	Taylor and Fillmore.....	1 5 8
2. Thomas M. T. McKennan.....	Aug. 15, 1850	Pennsylvania.....	Fillmore.....	0 0 27
3. Alexander H. H. Steuart.....	Sept. 12, 1850	Virginia.....	do.....	2 5 25
4. Robert McClelland.....	Mar. 7, 1853	Michigan.....	Pierce.....	4 0 0
5. Jacob Thompson.....	Mar. 6, 1857	Mississippi.....	Buchanan.....	4 0 0
6. Caleb B. Smith.....	Mar. 5, 1861	Indiana.....	Lincoln.....	1 10 4
7. John P. Usher.....	Jan. 8, 1863	do.....	Lincoln and Johnson.....	2 4 7
8. James Harlan.....	May 15, 1865	Iowa.....	Johnson.....	1 2 12
9. Orville H. Browning.....	July 27, 1866	Illinois.....	do.....	2 7 10
10. Jacob B. Cox.....	Mar. 5, 1869	Ohio.....	Grant.....	1 7 27
11. Columbus Delano.....	Nov. 1, 1870	do.....	do.....	4 11 19
12. Zachariah Chandler.....	Oct. 19, 1875	Michigan.....	do.....	1 4 25
13. Carl Schurz.....	Mar. 12, 1877	Missouri.....	Hayes.....	3 11 24
14. Samuel J. Kirkwood.....	Mar. 5, 1881	Iowa.....	Garfield and Arthur.....	1 1 2
15. Henry M. Teller.....	Apr. 17, 1882	Colorado.....	Arthur.....	2 11 0
16. Lucius Q. C. Lamar.....	Mar. 6, 1885	Mississippi.....	Cleveland.....	2 10 10
17. William F. Vilas.....	Jan. 16, 1888	Wisconsin.....	do.....	1 1 22
18. John W. Noble.....	Mar. 6, 1889	Missouri.....	Harrison.....	4 0 0
19. Hoke Smith.....	Mar. 6, 1893	Georgia.....	Cleveland.....	3 5 25
20. David R. Francis.....	Sept. 1, 1896	Missouri.....	do.....	0 6 5
21. Cornelius N. Bliss.....	Mar. 5, 1897	New York.....	McKinley.....	1 11 15
22. Ethan Allen Hitchcock.....	Dec. 21, 1898 ¹	Missouri.....	McKinley and Roosevelt.....	8 0 13
23. James R. Garfield.....	Jan. 15, 1907 ²	Ohio.....	Roosevelt.....	2 0 0
24. Richard A. Ballinger.....	Mar. 5, 1909	Washington.....	Taft.....	2 0 5
25. Walter L. Fisher.....	Mar. 7, 1911	Illinois.....	do.....	1 11 26
26. Franklin K. Lane.....	Mar. 6, 1913	California.....	Wilson.....	6 11 3 26
27. John Barton Payne.....	Feb. 28, 1920 ³	Illinois.....	do.....	0 11 20
28. Albert B. Fall.....	Mar. 5, 1921 ³	New Mexico.....	Harding.....	2 0 0
29. Hubert Work.....	Mar. 5, 1923 ⁶	Colorado.....	Harding and Coolidge.....	5 4 19
30. Roy O. West.....	July 20, 1928	Illinois.....	Coolidge.....	0 7 10
31. Ray Lyman Wilbur.....	Mar. 5, 1929	California.....	Hoover.....	0 0 0

¹ Entered on duty Feb. 20, 1899.² Entered on duty Mar. 5, 1907.³ The last day of Mr. Lane's service was Feb. 29, 1920.⁴ Entered on duty Mar. 15, 1920.⁵ Mr. Fall resigned, effective Mar. 4, 1923.⁶ Doctor Work resigned, effective July 24, 1923.

LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington, November 20, 1931.

SIR: I have the honor to transmit my annual report for the Interior Department for the fiscal year ending June 30, 1931.

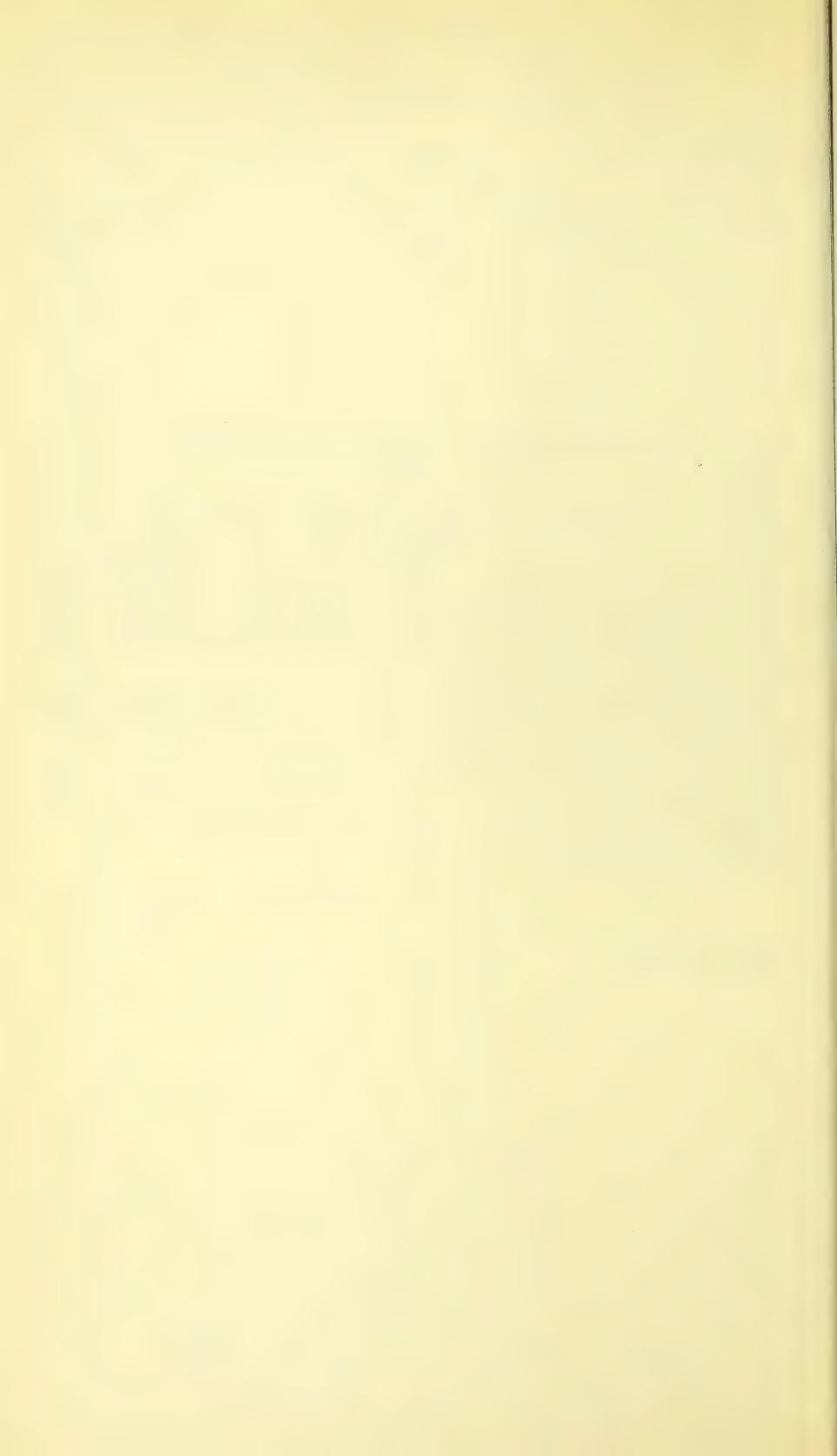
It is divided into three parts: I, Foreword; II, The Current Year's Operations; III, The Past Year's Work in Brief.

This year marked the return of reports by three important fact-finding commissions on problems with which the Interior Department is associated: The Public Domain Commission, the National Advisory Committee on Education, and the White House Conference on Child Health and Protection. Reference to these reports is included with the account of the current year's operations.

Very respectfully,

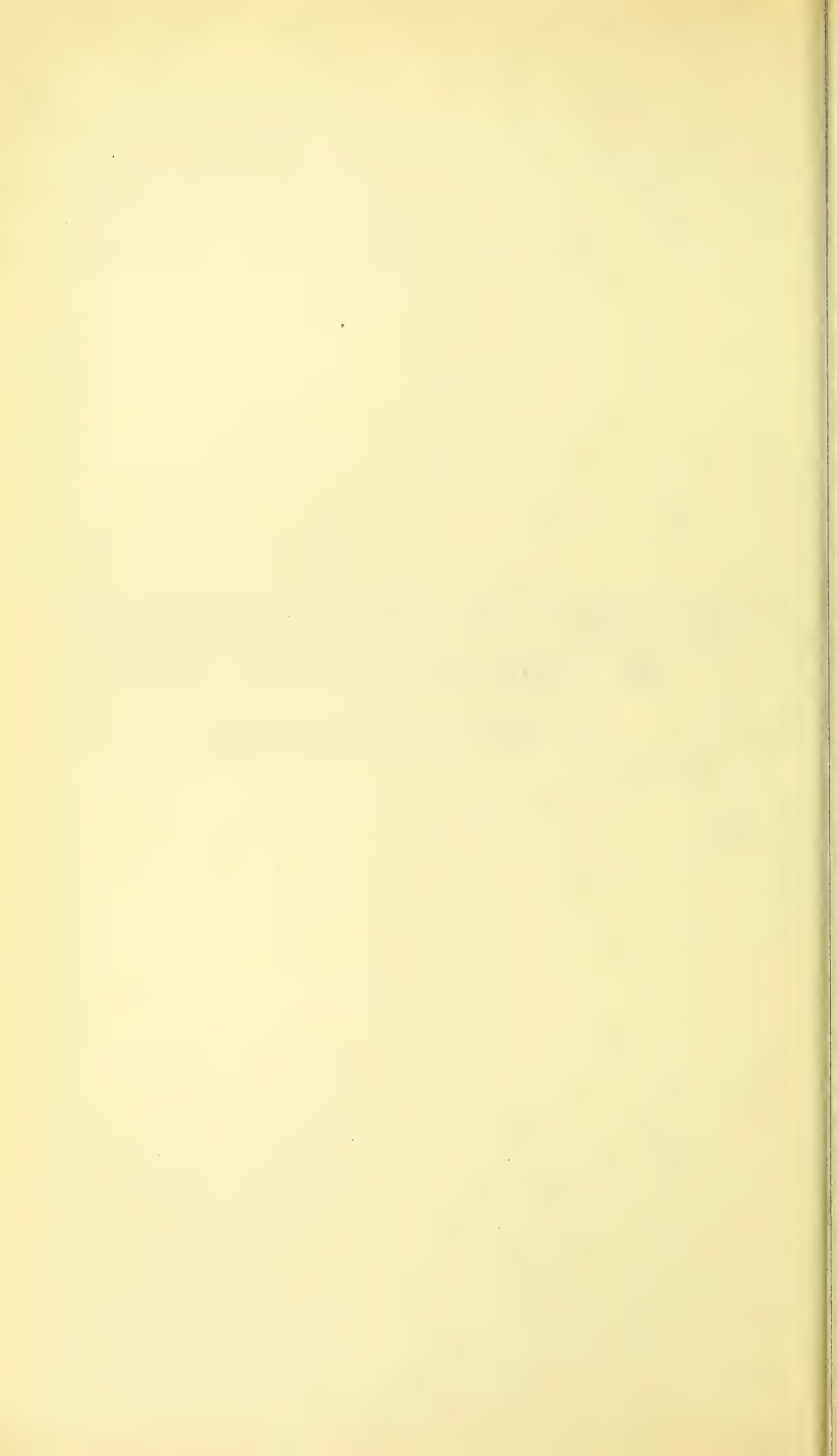
RAY LYMAN WILBUR,
Secretary.

The PRESIDENT.



*REPORT OF THE SECRETARY
OF THE INTERIOR, 1931
PART I: FOREWORD*

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REPORT OF THE SECRETARY OF THE INTERIOR, 1931

PART I: FOREWORD

Many of to-day's problems of government belong many hundred miles closer to the people than is the city of Washington. In 11 of our States a great part of all the land is owned by a landlord from two to three thousand miles away who has done nothing to protect his neighbors from the floods, erosion, and other consequences of allowing overgrazing on his own lands. In every State there is a locally conceived and locally administered school system which has come more and more under the influence of the Federal dollar. In the conservation of oil and gas there is just beginning to be a realization that 10 oil-producing States are trustees for the Nation and must themselves act. In 20 of our States are scattered 300,000 citizens who are set apart from their white neighbors in their relationship to the State, and whose property is largely administered from Washington because they have not been taught to own it.

We hope that we are in the midst of a movement back to local responsibility in some of these fields.

The Committee on the Conservation and Administration of the Public Domain, appointed by the President, has rendered a significant report recommending that in the course of the next 10 years the surface of the public domain be transferred to those States which are willing to accept the responsibility for it, and that in those States which do not so elect the Government for the first time set up an adequate system of range control. The Western States are full grown, know more about their local problems than anyone else, and should assume the administration of the lands within their borders. Wherever ownership rests in one sovereignty and the police power in another, there will be neglect of the property. There has been such

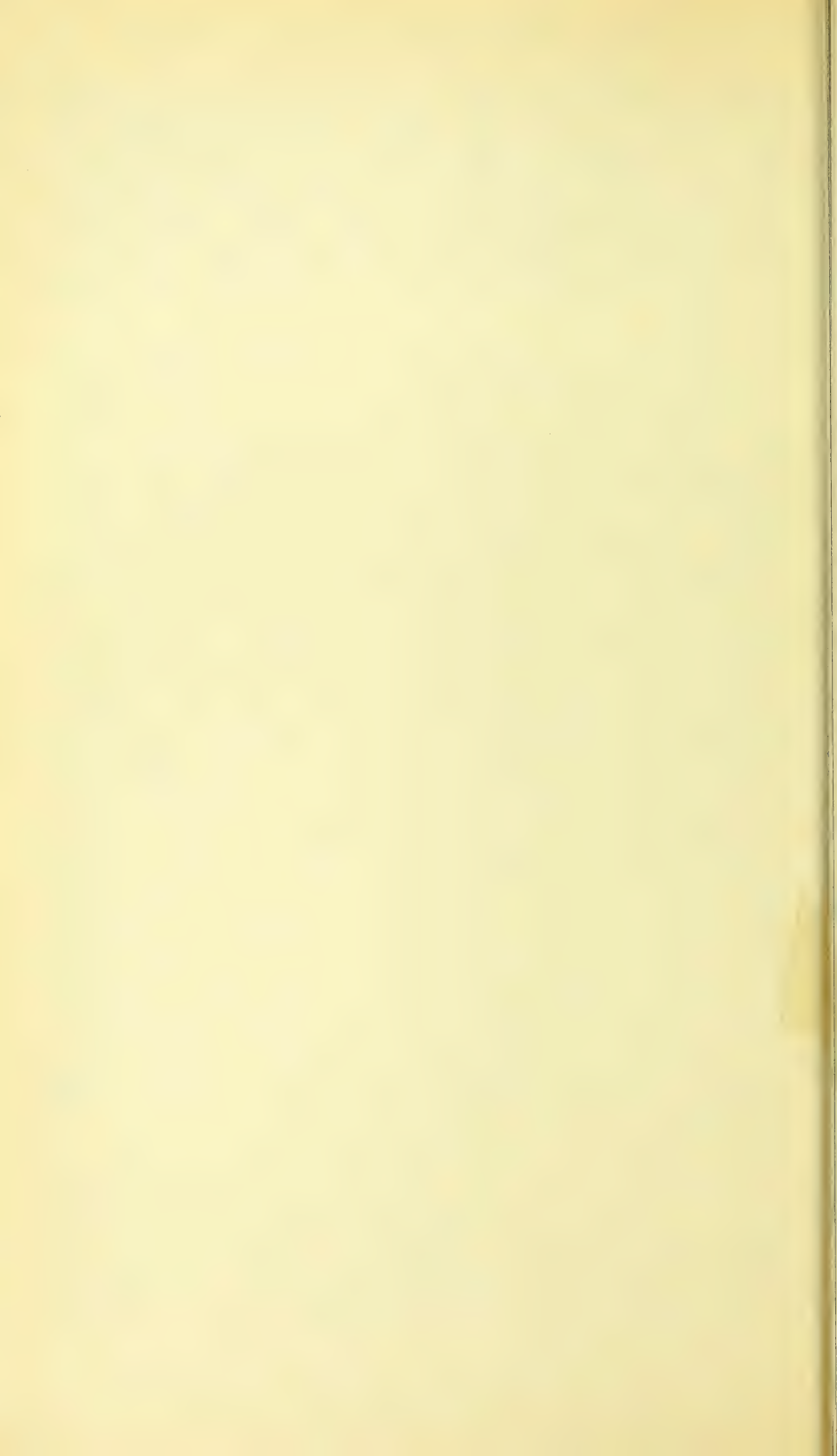
neglect in every Western State. The rainfall has not changed a great deal in the last 100 years, nor has the slope of the mountains. But in county after county the desert rains now rush down through gulleys, flooding farms and carrying off the surface soil to ruin reservoirs, whereas when the white man first came the sagebrush and the desert grasses retained the rains, held the soil, and protected the watersheds. There is not a single Federal statute on the books which adequately regulates grazing on the public domain; it has generally been open range, which the Government will not protect and the States can not. The time has come when we must allow these western citizens to protect their property if we will not protect our own.

In the field of oil and gas conservation the most significant development to date has been the 1-page compact signed on September 13 between the Governors of Oklahoma, Kansas, and Texas agreeing to restrict production to a scientifically determined figure. These oil-producing States, with the informal adherence of California, New Mexico, Colorado, and Wyoming, have for the first time collectively used their police power for the conservation of a natural resource which is too widely scattered for any one State to control by itself. I am glad to say that the Federal Government has done its share; the conservation order of March, 1929, stopped overdrilling and overproduction in the one sphere where we could control it, the public domain. As long ago as 1926 the Federal Oil Conservation Board urged an interstate agreement, and in 1929 I laid such a program before the Colorado Springs Oil Conference. Although the support for this program during the last five years has come largely from the Federal Government, this does not detract from the fact that the credit for the accomplishment belongs to the State executives and their public-utility commissions who accomplished the job. The effect has been an immediate increase in the value of oil and a decrease in its wasteful use. We can look forward with some hope to a permanent working arrangement, sanctioned by Congress, which will include the following elements: An adequate conservation agency in each State, enforcing within its boundaries conservation laws which are uniform in principle with those of the other major producing States; an interstate advisory board constantly studying supply and demand and fixing periodic quotas for production by the various States; an interstate compact under which

the States agree to appoint this committee and enforce these quotas, and perhaps agree on certain uniform practices of conservation; and a joint Federal and State participation in negotiation with foreign governments for foreign production quotas to correspond with our own, so that conservation in this country will not be followed by excessive importations or undue loss of our export trade. Some form of Federal protection of the consumer in this system is necessary.

In the field of education the National Advisory Committee on Education, appointed by the President, has just rendered a report which points out that the inherent strength of the American education system is that it is administered by 150,000 local school boards responsible to local opinion in lieu of a national ministry at Washington. If we needed any reminder of the benefits of the traditional American system, we can look to the Federal experiment in the control of Indian education and thank Providence that our educational troubles are solved at home and not in Washington.

For a hundred years we have been busy setting up islands in our civilization upon which we have maintained a native Indian population isolated in education, in industrial training, and in economic contacts from the rest of us. As a result we now have 300,000 men, women, and children who are citizens of the United States, who live surrounded by white neighbors, but who look to Washington and not to themselves or their communities for most of the normal relationships between the citizen and the state. We have set a definite goal for the Indian Service—that it shall work itself out of a job in 25 years. We hope to accomplish in the next quarter century the breaking down of the cement which has been setting for four times that period. We hope to turn over to the States trained, alert, and active Indian citizens. Our degree of success will depend largely upon the willingness with which the States accept their part in the economic relationship.



PART II. CURRENT OPERATIONS

White House Conference on Child Health and Protection.

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The Public Domain Commission.

The General Land Office.

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Reclamation:

Hoover Dam.

The All-American Canal.

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Oil shale.

The Geological Survey.

The National Parks.

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The National Advisory Committee.

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The Office of Education.

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Howard University.

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Columbia Institution for the Deaf.

WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION

One of the important affiliated activities of the Department of the Interior has been the White House Conference on Child Health and Protection. This conference was called by the President in the summer of 1929. The general conference was held November 19 to 22, 1930, and the Medical Section conference February 19 to 21, 1931. The Secretary of the Interior was appointed chairman of the conference and is still serving in that capacity in the follow-up activities.

The two conferences were the result of the pooled efforts of 1,200 experts from all parts of the country—men and women leaders in every field touching the life and welfare of the child.

They brought together in the conferences reports showing the status of child life throughout the country, the activities of all agencies working for the care and betterment of children—medical, public health, educational, and social welfare—and made recommendations for improvement based on the findings. These reports, revised in the light of the discussion of the conferences, are now in process of publication. They represent the most comprehensive survey of our national child life which has ever been made.

The essence of the conference findings is expressed in a condensed document known as the Children's Charter which is made up of 19

objectives toward which communities, schools, and homes should work, under the conference pledge:

"President Hoover's White House Conference on Child Health and Protection, recognizing the rights of the child as the first rights of citizenship, pledges itself to these aims for the children of America.

"1. For every child spiritual and moral training to help him to stand firm under the pressure of life.

"2. For every child understanding and the guarding of his personality as his most precious right.

"3. For every child a home and that love and security which a home provides; and for that child who must receive foster care, the nearest substitute for his own home.

"4. For every child full preparation for his birth, his mother receiving prenatal, natal and postnatal care; and the establishment of such protective measures as will make child-bearing safer.

"5. For every child health protection from birth through adolescence, including periodical health examinations and, where needed, care of specialists and hospital treatment; regular dental examinations and care of the teeth; protective and preventive measures against communicable diseases; the insuring of pure food, pure milk, and pure water.

"6. For every child from birth through adolescence, promotion of health, including health instruction and a health program, wholesome physical and mental recreation, with teachers and leaders adequately trained.

"7. For every child a dwelling place safe, sanitary, and wholesome, with reasonable provisions for privacy, free from conditions which tend to thwart his development; and a home environment harmonious and enriching.

"8. For every child a school which is safe from hazards, sanitary, properly equipped, lighted, and ventilated. For younger children nursery schools and kindergartens to supplement home care.

"9. For every child a community which recognizes and plans for his needs, protects him against physical dangers, moral hazards, and disease; provides him with safe and wholesome places for play and recreation; and makes provision for his cultural and social needs.

"10. For every child an education which, through the discovery and development of his individual abilities, prepares him for life;

and through training and vocational guidance prepares him for a living which will yield him the maximum of satisfaction.

"11. For every child such teaching and training as will prepare him for successful parenthood, homemaking, and the rights of citizenship; and, for parents, supplementary training to fit them to deal wisely with the problems of parenthood.

"12. For every child education for safety and protection against accidents to which modern conditions subject him—those to which he is directly exposed and those which, through loss or maiming of his parents, affect him indirectly.

"13. For every child who is blind, deaf, crippled, or otherwise physically handicapped, and for the child who is mentally handicapped, such measures as will early discover and diagnose his handicap, provide care and treatment, and so train him that he may become an asset to society rather than a liability. Expenses of these services should be borne publicly where they can not be privately met.

"14. For every child who is in conflict with society the right to be dealt with intelligently as society's charge, not society's outcast; with the home, the school, the church, the court, and the institution when needed, shaped to return him whenever possible to the normal stream of life.

"15. For every child the right to grow up in a family with an adequate standard of living and the security of a stable income as the surest safeguard against social handicaps.

"16. For every child protection against labor that stunts growth, either physical or mental, that limits education, that deprives children of the right of comradeship, of play, and of joy.

"17. For every rural child as satisfactory schooling and health services as for the city child, and an extension to rural families of social, recreational, and cultural facilities.

"18. To supplement the home and the school in the training of youth, and to return to them those interests of which modern life tends to cheat children, every stimulation and encouragement should be given to the extension and development of the voluntary youth organizations.

"19. To make everywhere available these minimum protections of the health and welfare of children, there should be a district,

county, or community organization for health, education, and welfare, with full-time officials, coordinating with a state-wide program which will be responsive to a nation-wide service of general information, statistics, and scientific research. This should include:

“(a) Trained, full-time public-health officials, with public-health nurses, sanitary inspection, and laboratory workers.

“(b) Available hospital beds.

“(c) Full-time public-welfare service for the relief, aid, and guidance of children in special need due to poverty, misfortune, or behavior difficulties, and for the protection of children from abuse, neglect, exploitation, or moral hazard.”

For every child these rights, regardless of race, or color, or situation, wherever he may live under the protection of the American flag.

The golden text of the charter is its closing words:

“For *every* child these rights, regardless of race, or color, or situation, wherever he may live under the protection of the American flag.”

Due to the nation-wide stimulus of the White House Conference an active follow-up in all parts of the country has resulted.

Up to November 20, 1931, State White House conferences had been held in the following States: Indiana, Georgia, Utah, New Jersey, New Hampshire, Florida, Mississippi, Maine, Oklahoma, Louisiana, Michigan, and Massachusetts.

The city of Chicago held a regional conference October 30-31, sponsored by 90 organizations. Local conferences have followed State conferences in many places.

Other State conferences scheduled are: Virginia, November 23-24; Idaho, November 24-25; South Carolina, first week in December; Montana, December 10-11; Ohio, January 26-28; Oregon, February, 1932.

The Children's Charter has been adopted as the basis of the year's program by the National Congress of Parents and Teachers. Some other national organizations actively cooperating with the conference to make effective the points of the Charter are: The American Legion (child welfare division), American Library Association, American Child Health Association, American Dental Association, American Association of University Women, Methodist Episcopal Church South, Kiwanis, National Grange, National Council of Parent Education, National Education Association, American

Home Economics Association, Child Welfare League of America, Boy Scouts, Women's Christian Temperance Union, Women of Mooseheart Legion.

The publications of the conference embodying the findings of the committees will reach a total of possibly 40 volumes, making, when finished, a comprehensive library of child life. Seven volumes have already appeared, one, White House Conference, 1930, giving a summary of the main conference with the speeches and abstracts of committee reports; three are in the field of education; two in the field of medical care; one in the field of public health. Other volumes will appear rapidly from the press of the Century Co. Several of these will deal with the educational problems of our Territorial schools and with conditions educational and otherwise among the Indians.

The conference maintains an administrative and editorial office in the Interior Building which will continue until the publications have been completed and the follow-up throughout the country initiated. The findings of the conference will then become an integral part of the State and community programs for the children of the Nation.

INDIANS

The historical basis of handling the Indian's affairs by combining in the Federal Government the functions which in the case of his white neighbors are found in the county, the State, and the Federal Governments, never has been very satisfactory. For a hundred years the wheels of Federal administration have worn a deeper and deeper rut of dependence. We can probably make a distinction between the Indian's health and education and his property. Until the States develop proper protective laws for the Indians' property, Federal responsibility is inevitable, but there is no good reason for maintaining separate schools and health programs for Indian boys and girls when the State already provides them. If the Indian youth is to ever succeed as a member of American society, he must have the same opportunity as do other children. We can not expect to put the Indian to work on a self-supporting basis unless he is properly prepared. The reservation develops a sense of retreat and of defeat in the mind of the Indian. His education should give him confidence that he can do as well as his neighbor. There is no possible escape

from the fact that we can not make citizens of the United States by any process of trusteeship and wardship. Citizens must make themselves by their own self-development and by accepting responsibility for both person and property. The idea that the Government by any process can manufacture citizens is a fallacy. It can only provide opportunity. The sooner the Indian grasps the fact that his present success means his amalgamation with the general population the better the results are bound to be. There will always be a percentage of dissatisfaction when one person's affairs are handled by another. Certainly no one can say that a policy that has been recognized as at least a partial failure, and has extended over four generations of Indians, should be maintained indefinitely simply because a system has been set up which needs to be supported. The Indian must learn to want to be free.

Under Commissioner Rhoads and Assistant Commissioner Scattergood a courageous beginning has been made. For the first time in a century the administration of the activities relating to the Indian's person and to his property are now separated. The recent reorganization of the Office of Indian Affairs has grouped the divisions of health, education, and agricultural extension and industry under an assistant to the commissioner in charge of "human relations"; and the divisions of forestry, irrigation, and lands are under an assistant to the commissioner in charge of property.

Of the 76,905 Indian children in school during the year ending June 30, 1931, some 43,652 were in public schools. The Federal Government has tuition arrangements with 2,568 school districts involving 36,753 Indian children, an increase of 341 districts and 10,055 children over last year. Three boarding schools have been closed and seven others now carry no grades below the fourth. Of these seven, four now take no children below junior high school.

In 1929-30 over one-half of the pupils in nonreservation schools were in high-school grades. This year the proportion is over three-quarters.

Whenever possible the Indian school curriculum is being adapted to conform with that of the State rather than to a uniform curriculum dictated from Washington.

The requirements have been raised in all branches of the Indian Service. Primary-school teachers are now required to have three

years of normal-school or college training. Matrons four years ago needed only an eighth-grade education; now at least one year's college is required. The superintendent of an Indian school must now have four years of college work, two years of postgraduate work, and four years' experience. Indian Service education requirements probably compare favorably with those of any State.

The Commissioner of Indian Affairs has given peremptory orders that no flogging will be tolerated. Cases of brutality are being summarily dealt with.

Ten additional Public Health Service doctors have been loaned to the Indian Service. Increased facilities are being added to many Indian Service hospitals. Under a \$75,000 appropriation a survey of tuberculosis, trachoma, and venereal-disease conditions among the Indians is now under way.

The appropriation for Indian education this year is over \$12,000,000; more than the appropriation for the whole Indian Service 10 years ago. This year it represents 42 per cent of the entire Indian appropriation.

In the field of agriculture extension and industry the past year has seen significant development. As one consequence of the drought-relief measures undertaken by the States, Red Cross, and Federal organizations subsistence farming in addition to commercial farming has been inaugurated in many localities. Gardens are being raised on thousands of Indian allotments where none has been grown before.

We can at once make up our minds that only a small percentage of Indians will be successful farmers. They have keen senses, well-poised nervous systems, and finely coordinated muscles. Mechanical ability is common, and many have real artistic capacity. This is good human material for our present world. There is hope, too, that by preserving and developing the Indian art many tribes possess a real contribution to our culture can be made.

In the past year employment offices have been maintained in 10 localities for the placement of Indians in industrial work. This is only a beginning, but this beginning should have dated from the 1880's instead of the 1930's.

There is considerable propaganda to the effect that the Indian is diseased and dying out. Actually he is slowly increasing in numbers.

Like the rest of us, he multiplies with a stable food supply. He is susceptible to tuberculosis, but resists many diseases better than his white neighbors. The 1931 population showed an increase of 3,544 persons, or 1.5 per cent, over 1930 outside of the Five Civilized Tribes. There a correction of old figures results in an apparent but not an actual decrease of the Indian total for 1931.

We have asked Congress (H. R. 15498, 71st Cong.) to authorize a codification of Indian laws. This sorely needed bill, designed to bring order out of the jumble of patchwork legislation through which the Indian Service must grope, was passed by the House but failed in the Senate. The filibuster in the Senate during the closing days of Congress also prevented the passage of H. R. 15603, a bill extending the restrictions on homestead allotments and accumulated funds of the Five Civilized Tribes. Despite the removal of restrictions the department has made every effort to protect the property of these Indians, and it is hoped an extension bill may pass in the next Congress.

The problem of settling old claims of various tribes against the Government continues to be a staggering burden upon the Court of Claims, the Comptroller General, and the Indian Service. A special Indian Court of Claims is urgently needed and will again be recommended to Congress.

The subject of law and order on Indian reservations is having the Indian Service's particular attention. The Institute for Government Research is also completing a study designed to straighten out the confusion that exists between Federal and State jurisdiction. The problem becomes more acute as time passes.

We have two major purposes constantly in mind. One is to turn over to the States as many active citizens as possible in lieu of wards supported by a distant Washington government, and the other is to give these people as adequate training in health, education, and economic independence as we can pending the assumption of those responsibilities by the local citizenship.

We have no desire to capture any more Indians. No premium is going to be put on adding new wards of the Government, keeping old ones, or extending reservations for them. Every Indian and his home constitute individual problems, and the home must be the starting point for their solution, as it is for white folks. It is as unscientific to generalize the "Indian problem" as it is to talk of a "white"

problem; but there are particular characteristics that the Indian brought into the world with him, and other characteristics that we have bestowed on him, particularly the conviction that Washington is going to run his life for him, that complicate matters.

THE REMAINING PUBLIC DOMAIN

The vacant lands subject to all applicable public land laws now total 177,101,551 acres. Of this area 127,265,885 acres are surveyed and it is estimated that 49,835,666 acres are unsurveyed. There are, however, other areas which are subject to acquisition under certain of the land laws but subject to reservations of various sorts. Thus, about 355,000,000 acres are subject to acquisition either outright, or for mining purposes only, or with minerals reserved, or subject to other qualifications. Below is a recapitulation:

	Acres
Vacant lands subject to all applicable public land laws.....	177, 101, 551. 00
National forest land subject to all mining laws and possible homestead entry	134, 000, 000. 00
Stock-raising homesteads, all mineral reserved.....	22, 341, 253. 90
All mineral reserved in patents under various acts other than stock raising homestead law.....	83, 783. 06
Coal reserved.....	10, 691, 715. 27
Oil, gas, phosphate, or specific mineral reserved.....	1, 562, 092. 78
Stock driveway withdrawals conditionally subject to the mining laws.....	9, 458, 390. 00
Total subject to all or some applicable public land laws--	355, 238, 786. 01

THE PUBLIC DOMAIN COMMISSION

The President, pursuant to the act of April 10, 1930, appointed a "Committee on the Conservation and Administration of the Public Domain," with former Secretary of the Interior James R. Garfield as chairman. Its function was to make recommendations for the future care of our remaining public domain. On January 16, 1931, it rendered to the President its significant report. Each of the 11 public-land States was represented by its governor's nominee, and a group of representative eastern men and one woman were also appointed by the President. This group of 20, by a report in which 19 of them joined, stated the problems and offered recommendations which can be summarized in their own words:

"1. The future disposition of the remaining vacant, unreserved, unappropriated public lands and the adoption of a definite program

of conservation of grazing resources either through ownership or control by the States or by Federal administration.

"2. The use and conservation of water resources, including reclamation and flood control.

"3. The conservation of subsurface mineral resources with respect particularly to the position which the States should occupy in any program.

"4. The conservation of timber resources with special consideration of national-forest areas, their usefulness within present limits, and the matter of additions to or eliminations from those limits.

"5. Changes in administration which might produce greater efficiency in the conservation and use of the natural resources of the Nation.

"Consideration of the questions submitted has led the committee to the following general conclusions and specific recommendations:

"It is the conclusion of the committee—

"1. That all portions of the unreserved and unappropriated public domain should be placed under responsible administration or regulation for the conservation and beneficial use of its resources.

"2. That additional areas important for national defense, reclamation purposes, reservoir sites, national forests, national parks, national monuments, and migratory-bird refuges should be reserved by the Federal Government for these purposes.

"3. That the remaining areas, which are valuable chiefly for the production of forage and can be effectively conserved and administered by the States containing them, should be granted to the States which will accept them.

"4. That in States not accepting such a grant of the public domain responsible administration or regulation should be provided.

"5. We recognize that the Nation is committed to a policy of conservation of certain mineral resources. We believe the States are conscious of the importance of such conservation, but that there is a diversity of opinion regarding any program which has for its purpose the wise use of those resources. Such a program must of necessity be based upon such uniformity of Federal and State legislation and administration as will safeguard the accepted principles of conservation and the reclamation fund. When such a program is developed and accepted by any State or States concerned, those resources should be transferred to the State. This is not intended to modify or be in conflict with the accepted policy of the Federal Government relating to the reservation stated in conclusion No. 2 above."

The general recommendations were followed by 20 specific ones.

It is proposed, in brief, that Congress tender to each State the remaining unreserved, unappropriated public domain within its

boundaries (reserving minerals in known mineral areas), and that the various States may have 10 years within which to accept the grant. At the end of that time the public domain in States not taking it over should be incorporated in a "national range" by congressional and Executive action. Meanwhile, a "national range" might be established before expiration of the 10-year period in any State on the State's request. Certain procedure for effecting the transfer is recommended. Certain described lands are excepted from the grant pending future study. These areas are those which the Forest Service thinks should be added in the near future to national forests. A board representing the National and State Governments would ultimately decide whether these areas should be added to the national forests and whether certain lands now within national forest boundaries should be restored to the public domain. This proposed board would also select for Federal retention such sites as the Government may need for reservoirs, reclamation purposes, national parks, defense purposes, migratory-bird refuges, etc. Certain exchanges of lands would be authorized to eliminate the present checkerboard of Federal, State, and railroad sections.

Very important is the proviso that all lands passing to the States should be "impressed with a trust for administration and rehabilitation of the public domain and for public institutions and with such restrictions as Congress might deem appropriate." Three such restrictions are suggested: (*a*) The State should be allowed to dispose of the land only at public auction, with reservation of minerals; (*b*) none of the lands should be disposed of by the States except by general laws; (*c*) all proceeds should be invested by the State in a permanent fund to be guaranteed against loss or diversion.

The committee recommends that the present conservative policy of reclamation, limiting construction each year to the annual income to the reclamation fund, should be continued, and that receipts from the development of hydroelectric power on the projects should be used first to repay the cost of the power plant and appurtenant works; second, the cost of the reservoir and dam regulating the delivery of water to the plant, and after that, all net revenues should be credited to the reclamation revolving fund.

Congress is asked to provide funds for the survey of the remaining unsurveyed public land.

The committee recommends long-time grazing permits in case the land is held in a national range, but ultimately, if the lands pass to the States, private ownership, with all the responsibilities of property, is set as the objective.

The committee's recommendations close with No. 20:

"20. In order to provide for a more effective administration of the public domain and the various reservations and areas now under the control of the Federal Government and to promote the conservation of natural resources, it is recommended that the Congress be asked to authorize the President to consolidate and coordinate the executive and administrative bureaus, agencies, and offices created for or concerned with the administration of the laws relating to the use and disposition of the public domain, the administration of the national reservations, and the conservation of natural resources."

This committee's report makes very clear a problem that is very old. Control of grazing is vitally necessary to preserve the carrying capacity of the range and to prevent soil erosion, floods, and the silting of reservoirs. Congress has never authorized either the Land Office or the States to protect these lands. Now, before it is too late, the choice must be made between the agencies that are to do the job. The Western States are grown to maturity and are alive to the problem. But if Congress is unwilling to let them solve it, it should let the National Government do it. Both are helpless now. So the committee recommends, first, transfer to the States; second, if the States do not want the task, creation of nationally administered national ranges. In its essentials this committee's report is inescapably sound.

Exceptions will be taken to many details by proponents of particular ideas. Thus some believe that minerals should not be reserved by the Federal Government. This view overlooks the fact that 90 per cent of the Federal revenue from these minerals now goes to the States; 37½ per cent direct and 52½ per cent to the reclamation fund, and the States individually take in from their lands already granted them by the United States about two and a half million annually. If minerals were transferred, the immediate effect, quite aside from the national interest in their wisest use, would be the crippling of reclamation. Its fund is now expended where needed, regardless of which State produced the royalty oil and gas.

As long ago as 1905 a Roosevelt commission made a study of the public domain, and particularly the grazing problem, and recom-

mended immediate control. But such authority has never been lodged by Congress in any agency, and the problem now is more acute by just 26 years.

THE GENERAL LAND OFFICE

The Commissioner of the Land Office reports that "the depression has in no manner lessened the demand for our remaining public lands." The area included in original selections, entries, and filings from July 1, 1930, to June 30, 1931, was 5,218,627 acres, almost equal to that of 1930 and greatly in excess of 1929. Of the five million and odd acres entered, 4,201,766 acres were allowed under the stock-raising homestead act. Comment on the operation of this act is made elsewhere. This past year saw 1,938,864 acres patented, of which 1,058,102 acres were patented with all minerals reserved under various acts.

The receipts and disbursements of the Land Office again present an interesting picture. It received from sales, oil and gas royalties, coal leases, and other sources a total of \$4,621,338.53. Of this sum \$2,396,605.13 went to the reclamation fund, \$1,610,852.37 went to the States, and only \$613,881.03 remained in the Federal Treasury. All of these figures exclude sales and leases from Indian lands.

Total expenditures for the conduct of business of the General Land Office amounted to \$2,158,159.81. Thus, the total benefit of the States and the reclamation fund is slightly over \$4,000,000 by virtue of the fact that the Land Office is one revenue-producing activity of the Government.

The Land Office is continuing its gradual completion of the rectangular surveys of the United States. It is a long process under moderate appropriations. It has been pointed out elsewhere that about 50,000,000 acres of the unreserved public domain remained to be surveyed, and eventually the rectangular surveys should be extended over the entire United States. These rectangular surveys should not be confused with the topographic survey of the United States which the Geological Survey now has in progress; both are far from complete. This rectangular system is the most scientific method of land designation that has yet been devised. The Land Office, if the surface of the public land is transferred to the States,

will face a period of heightened activity and responsibility in completing the surveys of these areas and in handling the clear listing requisite for transfer of title.

STOCK-RAISING HOMESTEAD LAW

At present we have under way a survey of the operation of the stock-raising homestead law in the Western States. Complaints against abuse of it have been increasing, particularly on some of the remaining public range in Colorado. Under this law 640 acres may be acquired as a stock-raising homestead, with minerals reserved to the Government. Those opposed to the law assert that many such homesteads are acquired by dummies for the benefit of stockmen, and that in many other cases 640 acres is entirely inadequate and necessitates grazing on the public domain in addition. From June 30, 1919, to June 30, 1931, 22,341,253.90 acres have been patented under the stock-raising homestead acts. Activity under these acts has greatly decreased. In 1922, 8,399 patents were issued and in fiscal year 1931 only 2,462. Last year's patents covered 1,051,593.21 acres. We have referred the problem to each member of the Public Domain Commission and to the governors of the Western States for their views.

RECLAMATION

Reclamation of public lands to date has added only about three-fourths of 1 per cent to our national crop area, but has added \$1,761,-929,500 to the purchasing power of the West. It is financed from a revolving fund. This fund bears a relationship to the Federal Treasury like that of a subsidiary to a parent corporation. Its expenditures can not exceed its own resources, regardless of the Treasury's surplus or deficit. Fifty-two and one-half per cent of royalties under the oil leasing act, and some proceeds of public-land sales, go into it. Of recent years royalties have made up about 26 per cent of the total annual income of about \$10,000,000, and land sales and power revenues about 7 per cent. Sixty-seven per cent has come from the repayments by the water users of the cost of their project works and other collections. Expenditures in the form of construction and maintenance costs have been limited to income. Most operation and maintenance has been taken over by the water users under the department's policy of encouraging local responsibility. The

percentage of collections has been uniformly high; 97.3 per cent of annual construction repayments and 98.1 per cent of operation and maintenance bills were met to June 30, 1931.

To-day we face a serious problem. Last year a number of causes accelerated outgo and retarded income. An open winter speeded up construction on some projects, and low prices for farm products coupled with legislative modification of contractual obligations depressed income. Congress responded to the emergency by extending to the reclamation fund a moratorium of two years on repayments by the bureau of \$1,000,000 a year on the \$20,000,000 loan which augmented the reclamation fund; \$10,000,000 of this loan had already been repaid. Congress further advanced a new loan of \$5,000,000 from the Federal Treasury, repayment of which at the rate of \$1,000,000 a year is to begin in 1933. Thus the reclamation fund, beginning July 1, 1932, will have to repay to the Treasury \$1,000,000 a year for 10 years, and beginning July 1, 1933, will have to pay an additional \$1,000,000 a year for 5 years. This situation makes it imperative that power revenues, whenever possible, must accrue to the reclamation fund, and not be diverted to the credit of the individual district, as has been required under some special legislation. It means also that all projects make every effort to keep their payments intact, for these are the backbone of reclamation's credit and the source of 67 per cent of its funds. Nevertheless, poor conditions on some projects already forecast more requests for moratoria. Such requests present troublesome problems. If granted, the landowner who needs no help and the landowner who is in trouble both benefit alike. Their State and county taxes and private debts are not ordinarily relaxed. The net result is that the blanket Federal relief is actually for the benefit of the local tax and banking structure. A reversal of this situation is often needed, because of the unscientific bases upon which lands frequently are assessed and grouped for tax purposes. Accordingly, we have under way a study of the financial situation on every project in order to be prepared to lay before Congress the relationship of these factors when and if moratoria are urged. Needed relief should be given by the sources which should fairly contribute, but the comparative situation of all projects should be seen before action is taken on one, and before the Federal Government assumes the whole burden of relief.

HOOVER DAM

Speed and size are the two outstanding factors in connection with the construction of Hoover Dam, the first unit of the Boulder Canyon project which was formally inaugurated by President Hoover with his approval on July 3, 1930, of the first appropriation of \$10,660,000 and on February 14, 1931, of an additional appropriation of \$15,000,000.

Plans and specifications for the 730-foot dam, the power plant, and appurtenant works were prepared at unprecedented speed, requiring the closest coordination of the Washington and Denver offices of the bureau to avoid any delay in their compilation, printing, and distribution to prospective bidders. As a result of this coordination the work was completed in a minimum of time, and on March 11, 1931, the Secretary of the Interior signed the award of contract to the Six Companies (Inc.), of San Francisco, the low bidder, at the bid price of \$48,890,995. The contract price does not include the furnishing of materials which enter into the completed work, such as cement, reinforcing steel, pipe and fittings, conduits, valves, gates and hoists, and structural steel. The total estimated cost of the work covered by the contract, including all materials, is about \$92,000,000. The power machinery and its installation will cost an additional \$17,000,000.

Other work completed includes the construction of a 22.7-mile branch railroad from the main line of the Union Pacific system near Las Vegas, Nev., to Boulder City, the construction headquarters; a railroad 10 miles long connecting the end of the Las Vegas-Boulder City line with the dam site; 20 miles of railroad, one branch running to the boat landing and thence to the outlets of the diversion tunnels, and another branch running to the sand and gravel deposit in Arizona; the erection of a transmission line 235 miles long, from Victorville, Calif., to Hoover Dam site to furnish power for construction purposes; the construction of a 24-foot oil-macadam highway, 7 miles long, from Boulder City to the dam site; a 9-mile pipe line of a water system to provide for 5,000 people, the installation of pumps to lift the water 2,000 feet from the river to Boulder City, and a presedimentation basin and purification plant.

Bids were opened on the last day of the fiscal year, and contracts were let for work at Boulder City to include street, alley, parking-area and sidewalk grading; street paving; street and parking-area surfacing, curbs, and gutters; sidewalks; sanitary sewers; and water-distribution system. These contracts have been practically completed.

Office buildings, mess houses, clubhouse, commissary, dormitories, and about 150 four and two room cottages have been erected by the Six Companies, and about 30 permanent brick and stucco houses have been constructed by the bureau for its employees. Administrative, municipal, and dormitory buildings have also been erected.

The Six Companies (Inc.) is actively engaged on the excavation of the four tunnels, each 50 feet in diameter and with a total length of 3.1 miles, through which the Colorado River will be diverted during the period of construction of Hoover Dam. At the end of November work was about 12 per cent completed, comprising 14,000 feet of 12-foot diameter pioneer bore and 2,000 feet of 36 by 56 foot section.

From August 7 to August 13 labor difficulties were encountered, prompted by replacement of hand muckers by machine muckers, and refusal of the replaced men to accept the prevailing wage for other available work, \$4 per day. For about a week, up to 1,400 men were on strike and work was shut down by the Six Companies.

On August 13 the construction engineer ordered the Six Companies to resume work under their contract, and the hiring of men was begun at the entrance to the Federal reservation by the United States Labor Commissioner, preference being given to worthy former employees. By August 17 about 1,100 men were back on the job, and by the end of the month the force had been brought up to approximately 1,700. All labor is now hired through a Federal employment bureau established at Las Vegas, with the full approval of the Six Companies. During the closing months of the year between 2,600 and 2,700 men were being employed on the job. A recent report showed that 41 per cent of the employees of the Six Companies were ex-service men.

Boulder City business permits.

In order to control and supervise the various business activities at Boulder City, arrangements were made to issue permits to individuals and other private agencies to engage in specified lines of business. This work was organized by Mr. Louis C. Cramton, with a view to making Boulder City a substantial town instead of a construction camp. At the end of the fiscal year 295 formal applications had been filed for business permits in Boulder City, representing 36 States and 62 kinds of business. Permits were being issued on the basis of approved qualifications, and many lessees were actively engaged in preparations for building. Several had started actual construction.

Mr. Sims Ely was appointed city manager of Boulder City, and a permanent committee, comprising John C. Page, office engineer, Bureau of Reclamation; J. R. Alexander, district counsel, Bureau of Reclamation; and V. G. Evans, manager of the Boulder City Co., a Six Companies' subsidiary, has been designated to act in an advisory capacity to the construction engineer and the city manager.

THE ALL-AMERICAN CANAL

This project is the companion to Hoover Dam, both authorized by the Boulder Canyon project act. It contemplates substitution of an American-controlled source of water supply for the Imperial Valley in lieu of the present Mexican-controlled canal. Public lands will benefit by the new route. A diversion dam across the Colorado, and a canal across the sand hills to connect with the Imperial system, with a main branch to the Coachella Valley, are the principal works. The cost is estimated at about \$34,000,000. The district is now under an injunction to remove the diversion works from which its canal leads into Mexico and back. The international character of the present canal, serving lands in both Nations, has brought many difficulties despite the wish of both interests to cooperate. Much of the cost of the new canal would be necessitated in any event by the change of diversion works now required by decree.

All engineering plans have been completed, and on November 4, 1931, the Secretary of the Interior approved as to form a contract between the United States and the district for repayment of the cost in 40 years. It may be possible to request a small initial appropriation this year.

COLORADO RIVER WATER

On May 8, 1931, the United States Supreme Court handed down a decision dismissing the bill of the State of Arizona asking an injunction against the construction of Hoover Dam. The holding was in line with the Government's contention that Arizona was not injured either by the building of the dam or by the 6-State Colorado River compact to which she is not a party and by which she is not bound. The question of division of the Colorado's waters is thus not affected by the decision. No attempt, so far as is known, has been made by Arizona and California to come to an agreement on a water division since the decree. We have, nevertheless, proceeded on the basis that sooner or later Arizona would be in a position to utilize water from the Colorado. Accordingly the funds made available by the Boulder Canyon project act for investigation of projects on the river have been so allocated as to include investigation of Arizona possibilities. It is possible that a feasible Arizona project may be found to utilize the planned Imperial Dam, as Arizona's present Yuma project will do. Under the project act the quantity of water to which California may acquire title is limited for Arizona's benefit. Under the power allocation made last year Arizona is reserved 18 per cent, or about 118,000 horsepower, to take whenever her needs require. It is to be hoped that the States may bring their water allocations into accord sooner or later, but meanwhile these great works that are ready for present development need not be delayed.

The interstate water problem on the Colorado has had a counterpart within California. There, as a necessary preliminary to the all-American canal contract, it was necessary to have a determination of the priorities of the various California claimants. In November, 1930, the Secretary of the Interior referred the matter to the State for a recommendation. In August the State engineer, Mr. Ed. Hyatt, submitted a recommendation based on an agreement among all interests, which has been ratified by all but one claimant. It sets up an order of priorities as among seven users, subject to availability of their allocations under the Boulder Canyon project act and the Colorado River compact. It will be included in all California water contracts.

The project act contemplates subordinate compacts among the four upper basin States and the three lower ones. The upper-basin allocation is now subject to study by a conference of State representatives and Reclamation Bureau officers who have been asked to assist.

THE METROPOLITAN WATER DISTRICT

It is a pleasure to report that the Metropolitan Water District, of Southern California, contractor for 36 per cent of Hoover Dam power, has voted a \$220,000,000 bond issue to build its aqueduct to the Colorado River and has pledged its continued support of the Boulder Canyon project.

COLUMBIA BASIN PROJECT

There is now under way an effort by the States and communities of the Columbia River Basin—Washington, Idaho, Oregon—to evolve a counterpart of the Boulder Canyon project. An irrigation development of over 2,000,000 acres, watered by a dam or dams more expensive than Hoover Dam and financed by sale of power, is visualized. Federal funds, repaid out of power revenues, are wanted. The War Department engineers, pursuant to congressional direction, have completed their studies and the Bureau of Reclamation has been asked to add its review. It would be premature to state its conclusions in detail, but it appears in general that a project feasible from an economic and engineering standpoint can be worked out, financed by an adequate power market, provided all power users cooperate. The size of the investment is the major problem. Sooner or later the Columbia will go into harness of the same sort that we are splicing together in Black Canyon for the Colorado.

OIL AND GAS

The conservation policy: Three steps.

The conservation policy initiated March 12, 1929, and restated at the Colorado Springs conference of June, 1929, has had significant results. Pointing out on these two occasions the wastes of gas and oil attendant on overproduction, the Government pledged first a cessation of speculative prospecting on the public domain, second a program of orderly production from Government fields such as Kettleman Hills, and third, urged the States, who alone

have a measure of control over production on private lands, to coordinate their production through an interstate compact so that curtailment in one State could not be offset by increased production in another.

To-day the oil industry has back of it for the first time a stabilized source of supply and in front of it an indicated demand for 1932 which shows little effect of the depression.

The Government's efforts on its own lands: Steps one and two.

Specifically, the Government's efforts have reduced the outstanding prospecting permits from 17,431 to 3,750. The Government lands in Kettleman Hills were unitized and production there was stabilized at 60,000 barrels daily from a field capable of producing 300,000 daily at low costs, coupled with almost complete cessation of gas wastage which previously had exceeded 150,000,000 cubic feet a day. The Kettleman operators have voluntarily set a fine example of conservation and teamwork.

The interstate compact: The State's accomplishment.

Two years after the Colorado Springs conference a compact, in informal form, was signed on September 13, 1931, by the Governors of Oklahoma, Kansas, and Texas, setting quotas for each State's production so that the country's daily total during 1932 and the balance of 1931 will not exceed 2,379,000 barrels. It has been fairly well followed and it was immediately effective in raising oil prices above prevailing distress levels. It was preceded and made possible by the efforts of the Oil States' Advisory Committee, which presented a plan based on an interstate compact to the Federal Oil Conservation Board in April, and by the efforts of the Kansas Public Service Commission, the Oklahoma Corporation Commission, and the Texas Railroad Commission. These enforcing agencies met on September 11 and agreed upon a production allocation under the chairmanship of Mr. Thurman P. Hill, and the agreement was signed on behalf of their organizations and their governors on September 13, with the cooperation of Chairman Cicero Murray, of the Oil States' Advisory Committee. Its provisions have been temporarily enforced by martial law in Texas and Oklahoma on the initiative of the governors of those States.

Though time may be necessary to work it out, what we must eventually see is a State-Federal structure based on an interstate compact, as was pointed out at Colorado Springs and in the Federal Oil Conservation Board's 1929 report, for the problem requires exercise of governmental powers not possessed completely by either sovereignty. Each State must enact its own conservation laws within its own borders. But their effect should be coordinated through an interstate advisory board created by an interstate compact. This board should study demand and supply, as the Federal Oil Conservation Board's economic committee now does, and recommend State quotas to meet it; it should draft and recommend model conservation laws; it should be a clearing house for joint action. But the domestic quota is a relative term depending on world production. Negotiations for foreign cooperation in equating production should be carried on under Federal auspices with the cooperation of the interstate board. Such negotiations are academic in the absence of a compact because under the Constitution the Federal Government can not enforce a production quota within any State. The Kansas-Oklahoma-Texas agreement is a courageous and sensible beginning.

Federal legislation.

In order to make unit operation on public lands legally possible, the department presented to Congress amendments to sections 17 and 27 of the mineral leasing act, which were enacted in the act of July 3, 1930. This was a temporary act, expiring January 31, 1931. The Kettleman unit-plan agreement was inaugurated under it before its expiration, as was another unit-plan agreement in Little Buffalo Basin, Wyo. Thereafter, the department recommended that this policy be enacted in permanent legislation, and the act of March 4, 1931, accomplishes that purpose. This action by Congress set a notable example for State conservation efforts. It is interesting to note that Congress has twice had the mineral leasing act before it for amendments since the inauguration of the oil conservation policy in March, 1929, and the conservation efforts of the department have encountered no adverse legislation.

Litigation.

The administration's conservation policy was attacked by several mandamus actions in the District of Columbia Supreme Court,

designed to compel an acceptance of applications for prospecting permits and the issuance of permits. Four test cases involving various phases of the conservation policy were carried to the United States Supreme Court after the department had been upheld by the Court of Appeals. On May 18, 1931, the Supreme Court rendered a decision to the effect that the steps taken by the Secretary of the Interior were within his discretion, under the mineral leasing act, and declining to interfere therewith.

Operations on the public domain.

Oil production on the public domain last year was 23,821,111 barrels; 41,962,184,000 cubic feet of gas were produced and 111,499,598 gallons of natural gasoline. These figures represent a decrease in crude-oil production of 3,598,398 barrels, or 13.12 per cent, an increase of gas utilization of 2,838,068,000 cubic feet, or 7.25 per cent, and an increase of natural gasoline utilization of 10,029,297 gallons, or 9.88 per cent. Completion of new wells dropped from 209 to 146, or 30 per cent. Completions for the first six months of 1931 dropped to 30, from the 1930 figure of 73, a decrease of 59 per cent. Wells shut in on the public domain increased from 599 on July 1, 1930, to 699 on July 1, 1931, or approximately 17 per cent. Permits outstanding on July 1, 1931, totaled 3,750, as against 17,431 on March 1, 1929. Our policy of house-cleaning the speculative paper which had encumbered the public domain has produced results; eventually it will be down to a working basis of bona fide permits upon which a structure of conservative exploration can be built.

At present the following practices characterize the operation of this policy as to oil and gas: (1) Extension of permits for periods of two years on condition that no drilling be done during the first year, unless sooner authorized or required by the Secretary. (2) The issuance of leases on discovery with provision for drilling and producing only such wells as are required to offset drainage. (3) Authorization of drilling programs on leases on the basis of one well per 40-acre tract. (4) Acceptance of compensatory royalty in lieu of drilling wells to offset drainage from adjoining lands. (5) Collection of 5 cents per thousand cubic feet for all natural gas wasted by blowing into the air.

All equities under bona fide permits are being liberally dealt with. Extensions are granted where equities justify it and new permits are issued when adequate showing is made of equities established before the conservation order of March, 1929, went into effect.

Thus, during the past year 103 oil and gas leases covering 63,102 acres and 91 permits covering 142,196 acres were issued.

We can look forward now to an eventual resumption of activity on the public lands under sound and conservative practices which will substitute unit operation and ratable production for the orgy of speculation which had covered 15,000,000 acres with over 17,000 permits, less than 4,000 of which ever complied with the leasing law's development requirement, and all of which were ready tinder for a blaze of speculative activity in case of another major discovery.

Imports.

During the past year substantial reductions were effected in importations of oil and refined products. For the April-September period, total imports were 26.6 per cent under the 1930 figures, largely as the result of the Federal Oil Conservation Board's request of individual importers that they make their plans so as to relieve distressed domestic conditions as far as possible.

On June 29, 1931, I reported to the Senate Committee on Commerce, then considering an oil-tariff bill and an oil-embargo measure, my opinion that "It seems to me that the evident need is proration of imports under the guidance of some fact-finding body such as the Federal Trade Commission." I also stated: "The program of domestic curtailment of production necessarily curtailed the oil-producer's income, and naturally in seeking relief the producers have looked to a similar curtailment of imports from foreign fields. If proration is the logical method of control of supply, it would seem to be logical to apply it to imports. Briefly stated, since 1923, when exports and imports of all oils were practically equal in quantity, the exports of crude oil, and especially of refinery products, have largely exceeded imports in quantity, and very greatly exceeded them in value. Indeed, exports of petroleum products have made up the third largest item in the foreign trade of the United States. What the effect of restrictions would be upon the employment of labor in connection with oil refining and the effect upon employment in other industries is again beyond the knowledge of this department."

The problem, as Secretary Lamont pointed out at the Chicago meeting of the American Petroleum Institute, is ultimately one of equating foreign and domestic production. Foreign oil kept out of our domestic market will go into our foreign markets, for if it can be laid down on our doorstep cheaper than our own oil it can be laid down on that of our customers' likewise. The question is simply one of balance. For the time being the condition of the domestic industry, pending stabilization of east Texas, has been such that attention has been focused on imports. Now that we have temporarily put our house in order through the Kansas-Oklahoma-Texas compact, it is fair to look for a permanent basis upon which the threat of excessive imports will be removed as a disturbing factor in the domestic equation without unnecessarily displacing our exports and throwing them back on the domestic structure. Difficult times should not make us lose sight of the long-range view of our national resources, nor of the fact that with 20 per cent of the world's reserves, we are furnishing over 60 per cent of the world's production.

OIL SHALE

Since the last annual report the circumstances surrounding the Kelley oil-shale charges have been brought to light by the Senate Committee on Public Lands. It will be recalled that on September 28, 1930, Ralph S. Kelley, a land office employee, former chief of field division at Denver, published a letter of resignation, accusing the department of collusion with Colorado oil-shale locators in disposing of lands worth many billions of dollars. Subsequently a series of 14 syndicated articles appeared in the New York World amplifying these charges. Kelley had been called to Washington on July 7 to take charge of oil-shale matters in the Washington office, following his protracted but indefinite criticism of handling of cases here, and had failed to report for duty until August 5. Correspondence between Kelley and the World, brought to light by the Senate committee, showed that Kelley, from July 29 to the date of his resignation, September 28, had been arranging for sale of his material to the World. He signed a contract on September 11 under which he was to receive \$12,000 if he remained in Government service and completed his articles before resigning, or \$6,000 if he was caught and discharged. By use of repeated sick-leave applications and col-

laboration of World employees he succeeded in concealing his employment by the World while remaining in Government employment, and resigned as per schedule on September 28, a Sunday, in a letter broadcast before it had been received and which, of course, gave no opportunity for reply that day. When I received it on September 29, I refused the resignation, and on September 30, 1930, transmitted the case to the Attorney General for investigation. Kelley refused to answer any questions of the Department of Justice. After an exhaustive examination of the cases listed by Kelley in his articles, the Attorney General, on October 24, reported that "there is more evidence to support the conclusion that you and your department have been exceedingly strict and exacting in resisting claims for patents than that you have been too liberal."

Later the Senate Committee on Public Lands developed the facts stated above about his employment. He was paid his \$12,000, or about 50 cents per word. The venture was not a financial success, however. The World's correspondence with its agents and the 200 or more papers to whom it tried to sell the story makes entertaining reading but has no place here. However, in view of the publicity given the Kelley matter, the statement by the World published on December 25, 1930, in reply to the following letter, was gratifying.

[Statement by the World]

"From Secretary Wilbur:

"Between October 6 and 10, 1930, inclusive, the World published a series of articles over the signature of Ralph S. Kelley, a former chief of the field division of the United States land office at Denver, Colo. These articles not only criticized my administration as Secretary of the Interior but impugned my official and personal conduct.

"I do not question the absolute right of the World or any other newspaper to comment fairly upon the acts or policies of the Department of the Interior or of myself as its responsible head, nor the right to obtain, if possible, an investigation of the decisions, policies, or the personnel of the department. For my part I welcome such an investigation.

"I do deny your right, however, to publish such statements as were made by Mr. Kelley which reflect upon my personal integrity and which were untrue in fact. When the World opened its columns to Mr. Kelley and published his articles, not as communications re-

ceived unsolicited, but as paid special-feature articles, it afforded him not only a forum for the statement of his views but gave his charges an apparent indorsement and guaranty of truth.

"These charges of Mr. Kelley, with their irresistible inference, reflect seriously upon my good name, and I can not let such an unwarranted attack go unchallenged.

"I am presenting this aspect of the matter so that you may have opportunity, as an act of simple justice, to see that amends are made for this serious reflection upon me.

"RAY LYMAN WILBUR."

"The World has already stated, and it is very glad to state again, that in publishing Mr. Kelley's articles it did not indorse or guarantee the validity of his criticisms. It merely affirmed its conviction after careful investigation of Mr. Kelley's record that his charges were made in good faith and with technical competence. The only purpose which the World has sought to attain by the publication of Mr. Kelley's articles was to insure a full inquiry by the Senate into the questions which Mr. Kelley raised, and it has complete confidence that if the Senate authorizes the Public Lands Committee to conduct this investigation the truth will be fairly ascertained. The World is happy to note that Doctor Wilbur himself welcomes such an investigation, for his cooperation in this matter will contribute greatly toward public confidence in it. As to the question of Secretary Wilbur's personal integrity which he raises in this letter, the World can only say it has never believed or implied that in all these complicated transactions he did any dishonorable thing."—EDITOR THE WORLD.

In order to prevent a repetition of such sales of confidential information out of Government files to private parties without consent of Congress or the officer responsible for their custody, the chairman of the House Committee on Public Lands, after hearings on oil-shale legislation, and on the department's recommendation, introduced H. R. 17338. This bill would amend the Criminal Code to provide for the protection of War, Navy, Department of Justice, and other records, as well as our own, as follows:

"SEC. 129. (a) Whoever, having the custody of, or access to, by virtue of his employment by the United States, any record, proceeding, report, map, book, document, paper, or other thing specified in section 234, United States Code (Criminal Code, sec. 128), shall sell or publish the same or sell or publish information contained

therein, without the permission of Congress, or of the head of the bureau or department or other establishment having jurisdiction thereof, shall be fined not more than \$2,000 or imprisoned not more than three years, or both."

The oil-shale problem arises from the provision of section 37 of the mineral leasing act which permits claims located prior to the date of the act (February 25, 1920) to proceed to patent in compliance with the mining laws as they existed on that date. The principal requirements are good faith of the locator, performance of assessment work, and discovery. Some months prior to Kelley's resignation a Supreme Court decision in the case of *Wilbur v. Krushnic* had held that a locator in default in assessment work could resume work at any time in the absence of a challenge by the United States. Thereafter, convinced that many claims were being held without compliance with the law's requirement of assessment work, the department in January, 1930, had undertaken the task of physically posting notices of forfeiture on each claim as a preliminary step to adjudication. This work had been under way many months to the time of the Kelley matter. To date about 7,500 such claims have been posted; about 5,500 remain. Where the law as to discovery, assessment work, and good faith of locators has been complied with, patents issue on completion of \$500 of development work and application for patent. About 195,000 acres have been patented in all. The estimated oil-shale area in Colorado is about 1,496,027 acres, in Utah, 2,754,959, and in Wyoming, 4,006,805; 156,024 acres are included in two naval reserves.

Currently we have under way the immense task of adjudicating the status of all outstanding claims which the Kelley fiasco temporarily interrupted. We have requested the Senate Committee on Public Lands to continue to a thorough conclusion its examination of the oil-shale matter, particularly if it can lead to legislation clarifying the questions left uncertain by the leasing act.

The House Committee on the Public Lands has reported out a bill (H. R. 15002) designed to fix a dead line by which all claims must proceed to patent or be abandoned and relaxing the department's conservation policy by excusing certain defaults in assessment work. A full summary of the oil-shale problem and the department's requests for legislative clarification will be found in the report on this bill. (Report 2537, House; 71st Cong. 3d sess.)

THE GEOLOGICAL SURVEY

Established in 1879, the Geological Survey was given by Congress a broad mandate for "the classification of the public lands and examination of the geological structure, mineral resources and products of the national domain." Other related functions have been added from time to time. Building upon this legislative foundation, the Geological Survey for more than half a century has endeavored to maintain high standards of professional work and conduct, to make steady contributions to the advance of knowledge within its assigned fields, and to apply this knowledge in the mineral industry, in cartography, and in hydrography.

Fundamental research.

For the Geological Survey the year was one of gratifying progress. In 1931 the direct Federal appropriations and the funds otherwise available from Federal and State sources for work by and under supervision of the Geological Survey reached nearly \$5,000,000, the largest amount in its history. As a consequence, moderate expansion has been possible in the staff and in a number of its activities. Especially noteworthy has been the growth in geologic investigations and in studies of water resources. Geologic work was strengthened by an increase in the appropriation "for geologic surveys" and by the granting of a new fund "for fundamental research in geologic science" which permitted the beginning or resumption of studies in some of the many problems that have long awaited attention. Well-qualified scientists were added to the staff, and a satisfactory beginning is under way on an expanded program of research. Broadened investigations of the surface and underground waters of the country were made possible by markedly increased funds appropriated as a recognition by Congress of the national interest in this vital natural resource.

Potash.

A feature of the geologic work was the completion of the special 5-year potash exploration program authorized by Congress in 1926 and 1927, which was an outgrowth of general investigations by the Geological Survey during several preceding decades. Four sites for core tests were recommended to the Bureau of Mines during the year,

bringing the total number of sites thus recommended to 24, all but one in New Mexico and Texas. The geologic conditions of the areas investigated have certain resemblances to those of the German potash area. The explorations have disclosed substantial bodies of certain potash minerals that are apparently thick enough, rich enough, and shallow enough to justify mining operations. One company has now sunk a shaft and begun commercial production in the New Mexico field. In 1930 the United States produced only 15 per cent of its demand.

Alaska.

At the direction of Congress an exploratory program is under way in Alaska looking toward development of new industries and traffic for the Alaska Railroad.

Topographic surveys.

Further progress was made in the topographic survey of the United States, more than 18,000 square miles being covered. But as only 44.6 per cent of the area of the United States has yet been mapped, and only 0.4 per cent was added last year, any speeding of the project would be of great advantage. The stage of the unfinished work varies from 8 per cent complete in Florida to 98.6 per cent in New Hampshire. Nine States are completely mapped.

Mining supervision.

Conservation of the Nation's mineral resources was fostered through enforcement of the leasing laws and through encouragement and advice to operators for the adoption of the best mining practices. In this work the Geological Survey benefits the entire country not only by insuring the collection of proper rents and royalties from the public lands but also by safeguarding the development of the mineral deposits themselves and thus aiding in the reduction of waste.

Water power.

Through its activities in land classification we now have reserved 6,536,473 acres in 21 States and Alaska for future power reservoirs capable of producing 15,000,000 horsepower when economic conditions warrant. It gages stream flow through 2,663 gaging stations and furnishes the basic data on which the future development

of these sites will depend. It has in progress now 37 of its valuable "water resources" reports; 20 were completed last year. It makes ground-water investigations; 63 are in progress.

The Survey not only aids in classifying power possibilities for reservation on the public lands but makes monthly and annual reports of electrical production and fuel consumption. Its reports for the calendar year 1930 show that the total power generated dropped 1.5 per cent, to 95,936,000,000 kilowatt-hours, of which 34.4 per cent came from hydroelectric power and 65.6 per cent from steam. Hydroelectric power dropped 4.6 per cent, largely because of drought conditions. The total drop of 1.5 per cent is the first since 1921. Consumption of coal per kilowatt-hour generated dropped to 1.62 pounds, or 51 per cent of the 1919 rate, representing a continuation of the gain in efficiency that has been unbroken since 1919.

Dr. George Otis Smith.

After nearly 23 years' service as Director of the Geological Survey, Dr. George Otis Smith resigned on December 22, 1930, to accept an appointment as chairman of the reorganized Federal Power Commission. Doctor Smith's administration, covering nearly half the life of the Survey, spanned the period of its greatest expansion and the closest adaptation of its activities to the growing needs of the country. Fundamentally a scientific organization, engaged in research in geology and engineering, it has nevertheless constantly maintained the practical viewpoint and has sought always to make the activities of its technical staff applicable to the problems of daily life. Its geologic reports and maps have guided the search for our mineral deposits and aided in their development; its topographic maps find manifold uses in engineering fields; the results of its studies of our water supplies, both surface and underground, are basic in all plans for the development and use of water resources; its technical advice to the department in the administration of the agricultural and mineral land laws supplies the physical facts upon which proper administration rests. The development of the ideal of practical application of sound scientific work was a major objective sought and attained by Director Smith throughout his administration. His selection by the President to head the Federal Power Commission is a recognition of the practical idealism manifested in his guidance of Survey affairs.

THE NATIONAL PARKS

Our generation faces a major responsibility and a greater opportunity. One hundred years from now, as people look back on our use of this continent, we shall not be praised for our reckless use of its oil, nor the weakening of our watershed values through overgrazing, nor the loss of our forests; we shall be heartily damned for all these things. But we may take comfort in the knowledge that we shall certainly be thanked for the national parks.

Two dozen of the treasure spots which our growing population has surrounded have been set apart from private acquisition and held for public enjoyment in perpetuity. The task is not finished and the opportunity is not gone. These years should constitute the era of completion of the park system. Grand Teton National Park is a skeleton with much essential land still privately owned, and the greatest herd of elk in this country remains subject to slaughter because of it. Mammoth Cave, Isle Royale in Michigan, the Everglades in Florida, certain Blue Ridge areas, and the Great Smokies—these are projects visualized but not yet complete. We always face two problems: One, to keep out the host of unworthy projects that are urged for national-park status for local reasons; second, to bring in those that are national heritages in fact and should be in law. It is surprising to an outsider to learn of the selfish determination in many places to hinder or to block park extensions completely. Even in areas where the generosity of private donors, such as Mr. John D. Rockefeller, jr., stands ready to make a gift of these treasure spots, local forces are often marshaled by selfish interests to prevent the transfer. We trust, nevertheless, that the acquisition of vital areas, particularly in the Grand Teton and Great Smoky areas, can be accomplished this year.

The movement eastward.

The National Park Service continues to extend its activities into the eastern portion of the United States. The Colonial National Monument in Virginia was established on December 30, 1930. In addition to Yorktown, the new monument includes the old colonial town of Williamsburg and Jamestown Island, the latter the site of the first English settlement in the United States. Provision is made for a parkway connecting the three historic areas.

The sesquicentennial celebration held at Yorktown October 16 to 19, 1931, in commemoration of the surrender of Lord Cornwallis, and arranged by the United States Yorktown Sesquicentennial Commission, was an unqualified success. The United States commission, the various cooperating agencies, and the National Park Service deserve congratulation.

Another important eastern development is the rehabilitation of the George Washington Birthplace National Monument at Wakefield, Va. Construction of the house and kitchen has been completed and much accomplished in landscaping the area and improving the old Washington family burial grounds. It is planned to dedicate this area to public use on next February 11, when the bicentennial celebrations start.

On November 2, 1931, representatives of the Governors of North Carolina and Tennessee presented the department with deeds to another area of 170,000 acres of land in the Great Smoky Mountains National Park. The total area deeded to the Federal Government is now approximately 300,000 acres. The park lacks but 130,000 acres of the minimum area specified by Congress for full development.

Another project east of the Mississippi is the proposed Isle Royale National Park, in Michigan. Authority for its establishment was given by Congress at the close of the last session. This project is now in the status of the Shenandoah and Mammoth Cave proposed parks; when the necessary lands therefor have been deeded to the United States, the parks will be established. Progress has been made on the latter two projects during the year, and the State association engaged in acquiring the Mammoth Cave area reports that sufficient funds are in hand to buy the necessary lands for park establishment.

Construction.

Construction and improvement activities were begun early in the season and carried as late into the fall as possible, and every effort made to furnish employment for local people. In those parks in the vicinity of Indian reservations many Indian laborers were employed.

In addition to the employment furnished through the regular park appropriations, a total of \$2,078,800 was allotted to the National Park Service from the emergency public-works funds, and this was used in road construction in areas in Virginia, Arizona, and Utah, where the emergency was particularly acute.

Roads and landscaping.

The Bureau of Public Roads continued throughout the year to render service in road building in the national parks and monuments under the agreement between the Department of Agriculture and the Department of the Interior. Through the interest of the bureau engineers in preserving the beauty of the natural landscape, the highways now being built in the parks not only are feats of engineering but are also superb from a scenic standpoint.

The Eastern National Park-to-Park Highway, designated last April, is an interesting development. At present it connects the Great Smoky Mountains National Park, the Colonial and George Washington Birthplace National Monuments, and the proposed Shenandoah and Mammoth Cave National Parks. Later it is hoped it may be extended to serve Acadia National Park in Maine, the proposed Isle Royale Park, and the Florida Everglades, should this project receive approval.

Educational and research activities.

To meet the increased popular demand, the educational programs in practically all of the national parks will be augmented during the coming year. Lectures, naturalist guided trips, both on foot and in auto caravans, and museum facilities, all were expanded last year.

Special emphasis has been laid by the new branch of education and research upon the historical aspects of park and monument work, and a new program dealing with the colonial history of the United States has been initiated.

The Educational Advisory Board, composed of eminent scientists and educators serving without pay, has continued to assist the Director of the National Park Service on difficult problems along their particular lines. One of their interesting current recommendations is that legal provision be made for a trust-fund committee to handle endowment funds.

Private-land problems.

The establishment of natural boundaries makes acquisition of adjoining lands a frequent problem; and within the parks themselves, private lands still constitute the most serious problem of administration and protection facing the National Park Service, despite the fact that excellent progress was made in eliminating some of them during the past year. For the purchase of such lands an appropriation of \$1,000,000 was made by Congress, all of it except \$200,000 to be expended on a 50-50 basis in cooperation with private funds. A total of 8,917.82 acres of alienated lands was brought into Government ownership during the fiscal year 1931. It is estimated that there still remain 95,138.60 acres of alienated lands in the national park and monument system. Had the Government commenced its policy by preservation of these areas for public use a quarter century earlier, millions of dollars would have been saved. We now face the identical problem: That of foreseeing the right of our grandchildren to certain remaining bits of primitive America and of preserving certain recreation areas for them.

EDUCATION: THE NATIONAL ADVISORY COMMITTEE

On December 3, 1929, the President appointed a committee consisting of 52 eminent men and women experienced in educational problems as the National Advisory Committee on Education, and asked them to give us the proper chart by which to select our educational course in so far as the Federal Government is concerned with it. The Secretary of the Interior and the Commissioner of Education were designated as liaison officers. On November 16, 1931, this committee rendered its report. It is the first comprehensive survey of the relationship of the Federal and State Governments to each other in the problem of education.

The committee states the issues which it examined as follows:

"Obligation.—Under our theory and practice of popular sovereignty, has the Federal Government an obligation to promote education in the United States?

"Control.—Shall we delegate to the Federal Government any basic and final political control over all or any part of the education of the American people, in the sense in which the States now exercise such powers?

"Finance.—Can and should we use the Federal tax system to aid the States financially in supporting American education without inevitably delegating to the Federal Government control of the social purposes and specific processes of education?

"Information.—Can an efficient national service of research and information operated by the Federal Government provide the intellectual assistance needed for stimulating and improving education in the States in such manner as to meet adequately the national responsibility for American education?"

It made a statement of policies on these issues under eight headings. These conclusions, with some of the comments of the committee, are as follows:

"1. Responsibility.—There are national responsibilities for education which only the Federal Government can adequately meet.

"2. Management.—Although the educational obligations of each of the three levels of American government, Federal, State, and local, are equally full and binding, these obligations may and ought, in fact, to be discharged by each of these governments in a somewhat different manner.

"3. Decentralization.—It is particularly unwise to centralize in the Federal Government the power of determining the social purposes to be served by educational institutions or of establishing the techniques of educational procedure.

"(a) Centralization is a radical departure from the long-standing American tradition of school management, which has given the American people a system of schools that is so responsive to the democratic popular will, need, and aspiration. It is most nearly free from social caste or class bias. In all its present trends it aims to discover and to cultivate in each member of the whole population the personal talents most useful to society and to the individual.

"(b) A system of decentralized school management is best adapted to a democratic nation of wide geographical expanse and varied economic, social, and other human conditions. The political domination of education by a remote central government, managed by administrative officers far removed from local conditions and sympathies, has always led to the evils of bureaucratic unresponsiveness to local and to changing needs, to bureaucratic standardization, red tape, and delay, and to official insensitiveness to the criticism of far-distant parents and citizens. Education is of too intimate concern to the American parents to be brought under a far-removed civil administration which tends toward relative inflexibility.

"(c) Partisan or class propaganda bringing itself to bear upon mature citizens in legislation is a serious enough difficulty for a

democracy. Once it is allowed to operate on the plastic and uncritical minds of youth at school, democracy faces a catastrophe. A decentralized system of management and control of schools is the one absolutely reliable antidote to the easy capture of schools by the propagandists of an economic, social, or political cult. * * *

"4. *Tax systems.*—The American people are justified in using their Federal tax system to give some financial aid to education in the States, provided they do this in a manner that does not delegate to the Federal Government any control of the social purposes and specific processes of education. * * *

"5. *Grants.*—If federally collected tax money is used to give financial aid to the States, it should be given to aid education as a whole and not as special grants for the stimulation of particular types of training. * * *

"6. *Matching.*—The matching of Federal money grants with State or local funds whether their use is for general or special educational purposes is a policy not to be favored in the field of education. * * *

"7. *Research.*—The Federal Government should render large intellectual assistance to the States in matters of education through scientific research, and the collection and dissemination of reliable information, particularly when the types of intellectual, scientific, and professional service needed can not be provided by the States and the local communities. * * *

"8. *Transition.*—Modification of the Federal means of aiding education should include provisions to assure adequate periods of transition."

For the furtherance of these policies the committee makes certain recommendations in Part II of its report. It says:

"To realize the policies presented in this report, there must be in the Government, close to its head coordinator, the Chief Executive, a spokesman for the American spirit and method in education who may on all occasions express that enlightened public opinion upon educational matters which is our surest guide in formulating public policy.

"The lack of such an official spokesman for education competent and influentially situated in the Government has been one of the conditions, and a major condition, which has permitted us to drift into our present dilemma, where a Nation, by tradition and experience opposed to the federalized administration of education, has in fact developed a pluralized Federal control of education in the States through various Federal agencies, which are not even coordinated in their efforts.

"This drift toward centralized Federal controls is attested by the efforts of enabling acts, land and money grants with a restricted educational purpose, and approvals and vetoes over State plans, all sanctioned by law and departmental rulings."

On this basis it recommends the creation of a Federal department of education, of which the present Office of Education would be the nucleus. The functions of the Federal Board for Vocational Education, stripped of the authority to withhold funds or require State matching of funds, would be transferred, as would the Public Health Service. Educational activities within each department, such as the Navy and War Departments and the Indian Service, would remain where they are, but an interdepartmental council on education would coordinate their work. As to the powers of such a department it says:

"*Powers.*—The Federal department of education as here recommended will have no legal or financial power and no regulatory or executive authority, direct or indirect, explicit or implied, by which it may control the social purposes and specific processes of education. This limitation of powers necessitates a complete reversal of the tendency exhibited in much recent Federal legislation to build up a centralized control of the purposes and processes of education in the Federal Government."

The policies outlined by the committee, emphasizing as they do the necessity for preserving the American theory of decentralization, are an excellent chart. The recommendation that they be furthered by creation of a Federal department of education deserves further study. My experience with Federal bureaus and departments does not encourage a belief that, once created, decentralization becomes their goal.

Because the Interior Department includes the Office of Education and has a large educational responsibility in the Indian Service, it has had an opportunity to see the Federal Government in operation in the educational field at both extremes. Our experience with centralized supervision of education for the Indians should warn the American people away from centralized control of their own education from Washington. Prejudice, bad advice, or lack of brains may temporarily flood any educational enterprise; but a ship with 48 compartments is hard to sink.

EDUCATION: NATIONAL ADVISORY COMMITTEE ON ILLITERACY

In the autumn of 1930, with the approval of the President and the cooperation of State superintendents of education, the Secretary of the Interior appointed a national advisory committee on illiteracy. Our 1920 census showed that there were 5,000,000 Americans over the age of 10 who could not read or write. This showing was accentuated by the discoveries about our citizenry during the World War. There has been a 12.6 per cent reduction in the last decade. At this rate it would take 50 years to bring reading and writing, the first tools of democracy, to the hands of a large element of our population. When the American people revived a political institution of antiquity, the Republic, they relied upon education to make an institution succeed here which had crumbled in the hands of the ancients. To-day we have in 43 States, and in over 1,000 centers of American life, regional committees at work on the problem. It is the first time in the history of the country that a national organization has been set up to combat illiteracy. It was made possible through the generosity of the Rosenwald Fund, John D. Rockefeller, jr., and others. We hope to lay a basis which will lead to the eradication of illiteracy within a decade. The presence of the Office of Education in this department, with its nation-wide research contacts, has offered a foundation from which to launch this attack.

EDUCATION: THE OFFICE OF EDUCATION

The Office of Education now has few administrative functions. It is an establishment for research and the dissemination of data on education. Those activities will become even more characteristic of it during the current year.

We now have under way three nation-wide surveys: Those in secondary education, the professional training of teachers, and school finances. They are conducted by the division of major surveys, created during the past year.

More than 50 minor research studies were completed and submitted for publication during the past year.

An important new effort will be that of the newly created section of negro education.

Contacts are kept up with foreign school systems. Statistics are compiled on a host of subjects in this country. Education by radio during the past year had the attention of a specialist, whose employment was made possible by the Payne Fund of New York City. A senior specialist in education by radio has lately been added to the regular staff of the office.

HAWAII

Hawaii, a melting pot whose population is 6 per cent Hawaiian, 8 per cent part Hawaiian, 7 per cent Portugese, 38 per cent Japanese, 17 per cent Filipino, and 12 per cent Caucasian, continues to develop a commercial integration with the United States which is remarkable. Income-tax payments to the United States Government last year ranked ahead of those from Alabama, Arizona, Arkansas, Mississippi, Montana, Nebraska, New Mexico, North Dakota, Oregon, South Carolina, South Dakota, Utah, and Vermont. Of the \$108,-439,103 worth of goods which she exported in fiscal year 1931, about \$99,000,000 came to the mainland of the United States. Incidentally, her balance of trade continued to be favorable; imports were only \$91,213,049, the great bulk of which came from the mainland. The two great exports are pineapples, which brought in \$39,000,000, and sugar, which realized \$59,000,000. Twenty-one steamers are in regular service between the mainland and Hawaii. Her population is about 368,336, an increase of 44 per cent over the 1920 figures. About 20,000 tourists, mostly from the mainland of the United States, visited the islands last year.

The Interior, the War, and the Navy Departments are the three Federal departments with which Hawaii comes most closely in contact. In civil matters the islands are almost entirely self-governed. The governor is appointed by the President but is a resident of Hawaii. The legislature and the county governments are locally elected.

There are under way in Hawaii a number of constructive governmental efforts. A quarter of the area of the islands is now under forest production. Reforestation is proceeding at the rate of about 28,000 trees per month, with an extraordinary percentage of survival of nearly 88 per cent. Educational curricula are being improved.

Emphasis is being put on subjects which will stimulate interests in local living problems. School attendance increased 5 per cent, to 76,634. Health is receiving more emphasis. Sanatorium care is provided where possible on the discovery of symptoms of tuberculosis in school children. Periodical tests, aided by pamphlets, visits of school nurses, moving-picture films, and radio are being put to use in the schools. The infant mortality rate has been reduced to 75.99 per thousand, the lowest in the history of the Territory. It is interesting to note that the highest rate is found among the native Hawaiian population, 199.49, and lowest in the Japanese element, 41.65. The death rate from tuberculosis is dropping slowly. Public-health nursing last year accounted for 17,038 visits to infants and preschool children.

Economic conditions continue on a steady plane (last year shows a new high record of production for the pineapple and sugar industries), with improving health and educational facilities and an established commercial tie to the mainland. Hawaii should continue to be a credit to her flag.

ALASKA

The development of this great frontier, like that of each of the American frontiers which have preceded it, will depend upon two factors: The attraction of wealth, and the pressure of population behind. The latter factor is not yet of great assistance. We have not yet consolidated and outgrown our conquest of the southern half of the continent. But because Alaska is one of the great reservoirs of natural resources to which we shall eventually turn, this department is endeavoring to stimulate the development of resources which will attract to that country the new settlers whom our present population has not yet propelled.

Although Alaska has produced since 1880 some \$629,313,000 in mineral wealth, there has been a gradual decline since 1916. However, gold mining is this year on the increase and it is expected that about \$8,476,000 will be extracted during calendar year 1931, as against \$7,761,000 in 1929. Copper production decreased this year by 8,000,000 pounds—the total was 32,651,000 pounds. The value of the copper output decreased from \$7,130,000 to \$4,244,600.

The fisheries showed a net decline of return to the fishermen of \$4,200,000; the net return this year was \$12,285,000. Twenty-seven thousand five hundred and sixty-eight persons were employed in fiscal year 1931 against the 1930 total of 29,283.

The Alaska Railroad.

Inasmuch as these two industries, mining and fishing, are responsible for over 90 per cent of Alaskan exports and 95 per cent of all labor, the effects upon the Government-owned Alaska Railroad have been serious. The railroad has been running behind about \$1,000,000 each year. In an endeavor to place it on a paying basis a Senate committee, after an investigation, recommended that freight rates be increased from 35 to 70 per cent and that passenger rates be increased 66⅔ per cent, and that train service be drastically cut. These recommendations were followed. Although reduced, the deficit amounted this year to \$589,750. The long-time effect on the growth of revenue remains to be seen.

The Senate committee's report has been published as Report 1230, Seventy-first Congress, third session. Heretofore, the fixing of rates has been a function exercised by administrative officers with an effort to promote local traffic. The policy required by the Senate committee, however, will be given a full and fair trial.

As mining always has been the great lodestone for Alaskan development, the Government has embarked on an exploratory program carried out by the Geological Survey in an endeavor to develop new possibilities. The last session of Congress appropriated \$250,000 for exploration designed to develop industries along the Alaska Railroad, and the program is now well under way. It is too early to predict what may be found.

Animal resources.

Among the interesting Alaskan statistics are those of the Government efforts to conserve animal resources.

The seal herd on the Pribiloff Islands was entrusted to the care of the United States by a convention with Great Britain in 1910. At that time the seal population was 132,000; in 1930 it was 1,045,101, although thousands of pelts had been taken meanwhile. The 1930 crop was 42,500.

The reindeer imported by the United States have increased in 40 years from 1,500 to approximately 1,000,000. This growth has brought a counterpart to the problems of the old western range. White owners and Eskimos have come into conflict over ownership of the herds and over grazing privileges. This year a reindeer council of six, representing natives, Government, and private interests, met and agreed upon certain range rules and supervision under a new reindeer service which is to be responsible to the Territorial government. Thirteen thousand natives are dependent on reindeer for a livelihood. About 2,500 own their own deer.

Local settlement of local problems.

This attempt to achieve a local settlement of the reindeer problem is one of our efforts to have as many Alaskan problems as possible settled in Alaska by Alaskans. Lack of Territorial finances prevents a complete present realization of this policy. Thus while the Territory educates the white children, Indian children are educated at the cost of the United States. This year the Office of Indian Affairs took over the administration of native schools from the Office of Education. Inasmuch as 48 cents of each dollar collected by the Territory goes for educational purposes, it is apparent that we can not now ask the Territory to assume the native educational burden, although that is where it ultimately should rest.

July 1, 1931, was the date upon which the transfer of native education from the Office of Education to the Office of Indian Affairs became effective. The current year, therefore, is the first under which the new regime will be operating.

Severe climatic conditions continue to make transportation and communication one of the principal obstacles to Alaska's growth. There are as yet no regular air mail routes. The governor strongly recommends that an Army air squadron be established in Alaska for training and incidental assistance in maintaining communication. The special air mail where utilized traverses in a few hours distances upon which the dog team requires weeks.

Alaska, despite the drop in mining and fishing activities, continues to maintain a fair balance of trade. In 1931 it was about 37 per cent of total commerce as against 36 per cent in 1930.

Medical welfare work.

Cruising up and down the Yukon River is a Government enterprise not paralleled elsewhere under the American flag. The medical boat last year treated 1,493 clinical cases, performed 234 surgical operations, and 4,122 dental operations in areas where other medical attention is seldom available.

Taxation.

There is no general Alaskan taxation system. Railroads pay 1 per cent of gross receipts, license taxes bring in some additional funds, and 25 per cent of the receipts of national forests go to the Territory. Its expenditures each year range between \$10,000,000 and \$12,000,000 and its income covers these.

Forests.

One of the great latent resources of Alaska is its forests. Thirteen per cent of the national forest area of the United States is in Alaska, most of it on the southern coast from Ketchikan to Cook Inlet. A billion board feet annually may be harvested each year. Ninety per cent of all production will be usable for paper. Hydroelectric power sites are abundant.

The Seattle-Canada-Fairbanks Highway.

An interesting project now under promotion is a highway from Seattle, Wash., to Fairbanks, Alaska. Alignment has been agreed upon by the Canadian authorities. When this road is completed there should be an immediate benefit to Alaska as well as the Canadian territory traversed the pressure of American population will come to bear upon these areas for the first time. Nearly 1,250 miles of this highway are already completed, principally from the Canadian border north into British Columbia. Ultimately it will be 2,200 miles long. Construction of about 970 miles is needed. We look forward to the hope of cooperation of our Canadian neighbors in making available to both countries the advantages of a connected line of communication.

NEGRO WELFARE

This department comes into contact with the problems of our negro people at three points: Howard University, here in Washington, partly financed by the Government; Freedmen's Hospital, also here; and the Virgin Islands. In addition, the Office of Education has created a new division of negro education, and we now have under way a survey by a national advisory committee on negro education. These activities are treated in more detail below.

FREEDMEN'S HOSPITAL

Freedmen's Hospital continues to perform a large philanthropic mission. Of 4,336 indoor patients under care during the year, only 871 were paying patients. Four thousand nine hundred and fifty emergency cases were cared for. We have secured an improved dietary department. Increased personnel and some staff housing buildings are asked by the surgeon in chief. The school of nursing has 108 students.

HOWARD UNIVERSITY

Howard University, with 2,380 undergraduates and 307 graduates, has had a year of progress. Sixty-three faculty members were added, bringing the prospect of a less hurried contact between the faculty and this large student body. A 20-year program outlined for the university by the Office of Education was accepted and recommended by the House Appropriations Committee. The law school was put on a 3-year basis and is now accredited both by the American Bar Association and the State of New York.

A building program is under way which will add new dormitories and new facilities.

VIRGIN ISLANDS

The Interior Department undertook a new responsibility on February 27, 1931. Prior to that time, Herbert D. Brown, Chief of the Bureau of Efficiency, had conducted an exhaustive investigation of conditions in the Virgin Islands, and had rendered to Congress a report recommending a detailed economic and welfare program and a transfer of jurisdiction from the Navy Department to the Interior Department. He also selected, and recommended for appointment as governor under the new regime, Paul M. Pearson, of Swarthmore College. Mr. Brown's recommendations were accepted, in large part, by Congress; and his recommendation for governor was followed by the President's appointment of Mr. Pearson.

The Virgin Islands were transferred to this department from the Navy by Executive order on February 27, 1931. They brought with them an economic and social problem dating back a hundred years. We acquired the islands (St. John, St. Thomas, St. Croix) from Denmark in 1917 as a naval base. The population had been

decreasing from 1835 on. Its per capita wealth was about one-eighth of that of the United States. About 90 per cent of the people are negroes or of negro blood, a peaceful and hospitable English-speaking people. Sixty per cent of the land on St. Thomas is still owned by 15 men; 80 per cent of that on St. John is owned by 12; 70 per cent of that on St. Croix belongs to 14. Since the United States acquired these islands it has spent more for their welfare than the former sovereignty had spent in 200 years. Nevertheless, each of the islands has suffered from economic factors beyond its control. St. Thomas's main income has always come from its harbor, where the native population formerly carried coal for the ships that once used this as a coaling port. Oil has largely replaced coal which has considerably reduced employment. The radio has made it unnecessary for ships to call there for cable instructions. Sugar production in St. Croix, the principal agricultural activity of the entire islands, has suffered from high average production costs and low crop ratios due to droughts, and from a depressed world sugar market. Modern methods have been lacking and the high proportion of tenant farming has not helped bring costs down. On St. John charcoal burning has used up much of the available forest cover.

Governor Pearson, with an initial appropriation of \$643,000, is attempting to get under way a program along the following lines:

1. Giving the natives' colonial councils major responsibilities; eliminating most Executive orders, putting natives in responsible jobs.

2. Improving the educational system by beginning agricultural and vocational training; an agricultural school is already appropriated for.

3. Teaching the people to raise gardens, and do subsistence farming; over a thousand have now been planted.

4. Getting the land into more diversified ownership through homesteads; we have made a beginning by negotiating for 2,300 acres to be so disposed of.

5. Persuading landowners to rent on a crop-sharing instead of a cash basis.

6. Giving better health education; the infant mortality is very high and the total mortality rate is three times that of continental United States.

7. Getting new banking resources; the charter of the Danish bank expires in 1934.

8. Encouraging new facilities for tourists.

9. Aiding cattle exportation; about \$80,000 worth have been shipped this year.

10. Eradicating the bollworm in an effort to revive the cotton industry; this requires that the native wild cotton, which is infested, be exterminated.

11. Reforesting abandoned farms; experiments are under way.

12. Organizing handicraft cooperatives; over 200 women have already been employed.

We face a long road toward economic stability in these islands. Rehabilitation is not the problem, for there never has been any real prosperity. Nowhere in the world has any government made so philanthropic an experiment in the aid of a people whose sovereignty it has acquired without gain to itself.

ST. ELIZABETHS HOSPITAL

St. Elizabeths Hospital brings us into practical contact with the problem of mental hygiene. This past year this institution had a daily average population of 4,602 persons whose mental health was far enough below par to require that they be set apart. At the close of the year there were 4,721, representing an overcrowding of facilities by nearly one-third. We now have authorization and some appropriations for a new tuberculosis building of 80 beds, two other buildings of 164 beds each, and a new male receiving building of 400 beds. These buildings will go up under a plan for future extension which will ultimately add nine more buildings and several thousand acres to the grounds. The sites are all located.

St. Elizabeths is a self-contained community the size of a small town. Its plant is valued at over \$7,000,000. The output of its farm, shops, etc., last year was valued at \$817,000. Its fine Holstein-Friesian herd has been tested free of tuberculosis for 17 consecutive years. The shoe shop produces all of the shoes used.

The Red Cross continues its quiet and effective work at St. Elizabeths. It maintains recreation facilities and keeps up contact with patients' families throughout the world. It assists in the adjustment

of home financial problems where it can. It maintains 3 psychiatric social workers, 3 recreation workers, and 3 secretaries.

Occupational therapy is undertaken wherever possible. Last year 959 patients made with their hands articles worth nearly \$27,000. Patients furnished five radio programs over local stations.

Study of mental hygiene and care of the mentally sick is a comparatively new science. More medical students and physicians need adequate training in psychiatry. There should be internes in every hospital for study of the care of the insane. The presence of the inquiring student would do more to advance pathological research in our mental hospitals than any other factor. There will be over 100 medical students interning in St. Elizabeths during the coming year, and 10 specializing in psychiatry. More of the research energy of the medical profession should be brought into the fields of psychology and psychiatry. Most important is the education of the public so that they will view mental diseases as they do other diseases.

Finally, the handling and care of the mentally ill should be along medical rather than legal lines. There should be as complete a release as possible from the meshes of the law which are now so difficult to escape. The policeman, instead of the doctor, is generally the first contact between the insane person and the Government. A jail instead of a hospital bed is generally his first confinement.

The superintendent of St. Elizabeths Hospital, Doctor White, again urges a revision of our District of Columbia laws. Bills to this effect (S. 5486 and H. R. 15609) were introduced at the last session, directed toward a change in the methods of admission. At least five changes would be in step with modern thinking:

1. Voluntary commitment should be allowed on the patient's request, subject to discharge on three days' notice.

2. Insane persons taken into custody should not be tried as criminals, but should be held in the hospital and treated. They should not be subject to trial unless on request of their relatives, guardian, or friends.

3. If a trial is demanded by the insane person, his guardian, his friends, or is directed by the court, the hearing should be without a jury, unless the insane man, his guardian, or his friends demand it.

4. Temporary commitment prior to permanent commitment should be provided for, subject to release on certificate to the District of

Columbia government by either the superintendent of the hospital, or by any two physicians in regular attendance at any other hospital, that sanity has been recovered or that the person is not insane.

5. There should be an automatic restoration of civil rights on discharge, provided a certificate be obtained from adequate authority that the patient is cured or that further treatment is unnecessary or undesirable.

These changes will tend to make the law more modern and more humanitarian. In all but seven States jury trial on the question of commitment has been abandoned. Every inducement should be offered for voluntary subjection to treatment. The law should be as unobtrusive as possible in permitting the care of the mentally sick, without attaching a personal stigma to them through court proceedings which are akin to criminal trials.

COLUMBIA INSTITUTION FOR THE DEAF

Gallaudet College and Kendall School make up this institution. Gallaudet this past year had 132 students from 35 States, Canada, and the District of Columbia. Kendall had 68.

A significant ceremony took place at Gallaudet; a gift of \$50,000 was tendered by the alumni in honor of the founder, Dr. Edward Miner Gallaudet. Though given in honor of another, the gift was a testimonial to the successful lives of the handicapped donors. The money will be used toward a library and laboratory building; Congress' help will be needed. Gallaudet's faculty salary scale is still inadequate, and new research facilities are needed for the advancement of education of the deaf.

A questionnaire to alumni as to occupations brought the information that 82 occupations are successfully followed by 721 former students. Teaching and printing head the list in numbers; the average salary is \$150 per month.

PART III: THE PAST YEAR'S WORK IN BRIEF

There follows a summary of the report of each officer reporting to the Secretary of the Interior. These reports are printed separately and may be obtained on application to the Department of the Interior. The tables printed in these separate reports are not reprinted here.

The activities covered:

The Solicitor's Office.

Board of Indian Commissioners.

Bureaus:

General Land Office.

Office of Indian Affairs.

Office of Education.

Geological Survey.

Bureau of Reclamation.

National Park Service.

Territories:

Territory of Alaska.

The Alaska Railroad.

Territory of Hawaii.

The Virgin Islands.

Institutions:

St. Elizabeths Hospital.

Freedmen's Hospital.

Howard University.

Columbia Institution for the Deaf.

Extra-Departmental Activities:

American Antiquities.

General Education Board.

Fuel Administration; Coal Commission.

Perry's Victory Memorial Commission.

THE SOLICITOR

SUMMARY OF REPORT

During the year the solicitor's office presented more than 40 oral arguments to courts of the District of Columbia in the submission of cases for decision and in hearings on various motions.

Two test cases involving losses claimed under the act of March 2, 1919 (40 Stat. 1272), commonly known as the war minerals relief act, brought in pursuance of the act of Congress of February 13, 1929 (45 Stat. 1166), are now pending in the Supreme Court of the United States on the merits. The particular items of loss covered are interest paid on borrowed capital and money expended for the purchase of mining properties. These two cases were decided by the Supreme Court of the District of Columbia in favor of the contention of the Secretary of the Interior that such losses are not reimbursable under the act. That court was reversed by the court of appeals (47 Fed. (2d) 422 and 424). A total of 346 suits were brought under this act.

To the 38 mandamus suits pending at the beginning of the year, the object of which was to require the Secretary of the Interior to issue oil and gas permits to the respective petitioners under the act of February 25, 1920, known as the leasing act, have been added 247

new cases. There were 8 test cases, 4 of which were decided by the court of appeals favorably to the department, and under a writ of certiorari its decision was affirmed by the Supreme Court of the United States.

On June 30, 1930, there were pending in the Supreme Court of the District of Columbia 392 cases involving departmental questions. During the year 280 new cases were filed. Of these, 23 were finally closed, leaving 649 yet to be acted on. A number of the pending cases eventually will be closed in harmony with the test cases involving the oil-conservation policy, when conditions will permit.

At the beginning of this fiscal year there were pending in the court of appeals 14 appeals. During the year 10 were decided—8 in favor of the department, 2 adversely. Four new appeals have been added, thus leaving on the docket of that court eight cases for review and decision.

The office cooperated with the Department of Justice in preparing the original case of the State of Utah *v.* United States in the Supreme Court, and with the Department of State in a matter before the United States-Canadian Commission, involving damage to public and Indian lands and timber from smelter fumes originating in Canada. The office also cooperated with the United States attorney for the District of Columbia in the case of Jones et al. *v.* The Power Commission and the Secretaries of Interior and Agriculture, involving a power project in Alaska, and with the United States attorney for the District of Columbia in the suit brought by certain Seminole Indians against the Secretaries of the Treasury and Interior. In the Osage extension cases involving tribal oil and gas rights in the Osage reservation, the assistant to the solicitor went personally to Oklahoma and cooperated with the United States attorney and the tribal special attorneys.

At the request of the Attorney General or the Solicitor General, the solicitor's office has also assisted the Department of Justice in preparing briefs, arguments, etc., in cases in the Supreme Court of the United States involving matters in which the Department of the Interior is interested. At the request of the Supreme Court of the District of Columbia in some 20 cases during the past year, special information in the form of memorandums, citations of authority, etc., have been supplied to the court. The solicitor and others in his office have also in numerous instances given oral advice and counsel to bureau chiefs, and attorneys from the various bureaus and offices of the department at their request and to assist them in discharge of their duties.

For the Federal Oil Conservation Board, the solicitor's office assisted in preparation of a compilation of statutes and regulations

of the several States relating to the production and conservation of oil and gas. It has also rendered assistance in the matter of personnel classification and in other miscellaneous matters.

The office has been sustained in the greater part of the litigation disposed of by the courts during the past year. Opinions rendered by the solicitor, in those cases where the same were reviewed by the Attorney General or by the courts, have generally received concurrence.

The solicitor is a member of the departmental oil committee, which reviews all applications for oil-permit extensions, leases, and miscellaneous matters relating to oil.

The following shows the other work performed by the office:

	Public land matters		Indian matters	Miscellaneous matters
	Appeals	Motions		
Pending July 1, 1930.....	740	16	23	33
Received during year.....	1, 114	118	17, 626	10, 656
Total.....	1, 854	134	17, 649	10, 689
Disposed of during year.....	1, 127	121	17, 631	10, 669
Pending June 30, 1931.....	727	13	18	20

"Miscellaneous matters" include the following:

Formal opinions by the solicitor.....	86
Reports on legislation.....	346
Contracts for the erection of buildings, for building of roads, for supplies, etc.....	1489
Cases prepared for submission to the Board of Equitable Adjudication.....	1046
Oil and gas matters:	
Leases.....	224
Prospecting permits—	
Reinstated.....	126
Granted.....	111
Assignments.....	303
Extensions of time.....	2563
Canceled.....	1656
Coal matters:	
Prospecting permits.....	93
Licenses.....	33
Leases.....	34
Potash matters:	
Leases.....	2
Prospecting permits.....	69

BOARD OF INDIAN COMMISSIONERS

SUMMARY OF THE REPORT OF THE BOARD (A BODY NOT AFFILIATED WITH THE INDIAN SERVICE, ACTING IN AN ADVISORY CAPACITY)

The Sixty-second Annual Report of the Board of Indian Commissioners to the Secretary of the Interior shows that members of the board during the year officially inspected 38 units of the Indian Service located in 15 different States. In its comments on conditions in the Indian country during this period under review, the board says that Indians as well as white farmers suffered practically complete crop losses in the drought area; that there was acute distress in some sections and in several areas the Red Cross joined its efforts with the Indian field service in providing emergency relief for Indian families. In the opinion of the board thousands of Indians probably would have suffered to a distressing degree had it not been for Congress and the Indian Service; Congress "promptly and heartily responded to the commissioners' urgent request to provide means for emergency relief."

The report features the cooperation in behalf of distressed Indians which brought together the Bureau of Indian Affairs, the Red Cross, the Department of Agriculture, State and county agricultural welfare organizations, and local associations. "Never before," says the report, "in the history of the Indian Service has there been such effective teamwork of this kind." Continuing, the report states that the successful effort in Indian relief and rehabilitation—

was characterized not only by fine teamwork with Federal, State, county, and private agencies, but also by determined effort to get the Indian to recognize the need of preparing for hard times by producing and laying up a sufficient store of food for family need during the winter.

The result of this relief and rehabilitation effort became apparent in the spring, for in a number of jurisdictions Indians planted more gardens than had ever been known before in those parts of the Indian country. Commenting on the unusual interest taken by the Indians in raising a part of their own food supplies, the board calls attention to a former annual report in which "subsistence farming" by Indians was stressed, and states that in planning to promote Indian progress the Indian home and Indian family should be given first consideration. The report asserts that neither Congress nor the

Indian Office has ever rightly appraised the Indian home as the "strategic center" of an endeavor in the scheme in helping Indians to make themselves self-reliant, and that the current appropriations for carrying on the extension of home and industrial activities is far from enough to adequately finance a program for bettering the home and helping the family toward self-reliance.

In its report the board takes issue with the Indian Office as respects some phases of the latter's educational policy. It believes that the new civil service requirements, set up by the Indian Office for entrance into the Indian school service, "are unnecessarily high." The report states that in the efforts of the Indian Office to secure a higher type of school personnel, the Indian Office places too much emphasis upon formal academic training and college degrees, stating:

We submit that for teachers and administrators in the Indian schools, experience, resourceful minds, Christian character, sympathy with the problems of the race, understanding of Indian peculiarities and common sense, grit, and gumption are more important than a college or normal-school degree.

Referring to the Indian field service the board's report states:

Members of the board while in the field during this year became conscious of a feeling of apprehension and uncertainty among the field personnel. Apparently this unsatisfactory mental attitude had been developed by the inelastic application of the new retirement act, which places the retiring age at 65 years instead of 70, as formerly; by several investigations which have been in progress, and by reports, seemingly emanating from Washington and which were given wide publicity, to the effect that the Indian Service was about to make sweeping changes in the agency and school service personnel. Although the reports were exaggerated it is a fact that in the last two years the changes in superintendents of agencies, reservation schools, sanatoria, and warehouses affected 58 field-service men. There were 64 changes in all, two each being made at six of the units.

We still hold the opinion that the best interests of the service and of the Indians would have been served had advantage been taken of the provision in the retirement act authorizing heads of department to continue the services of employees who had reached retiring age. Not only has the service unnecessarily lost the valuable experience and seasoned constructive talent of a number of faithful, conscientious employees but there has developed the feeling in the field that loyalty and experience are not regarded as service assets and desirable qualifications by the Indian Office in appraising the records of the field-service personnel.

One cause of the disquietude in the field was the abruptness which characterized a number of discharges, transfers, and promotions of employees. We hope that hereafter before action is taken which affects the status of a field employee the Indian Office will give the employee advanced information and a chance to be heard.

The board emphasizes the need of vocational training in the Indian schools, stating:

Several years ago the Board of Indian Commissioners took the position that the Indian Service schools should strive not so much for uniformity and standardization as for adaption to actual and varying needs; that they should not

endeavor to reproduce the experiments and failures of the public schools, but should apply methods suited to the special problem of the Indian, and that, above all, they should emphasize vocational training and the teaching of applicable and useful trades.

The board reports that pursuant to action taken at its annual meeting a conference was held in the board's office February 17 between a committee of the board and representatives of a number of mission boards of churches which maintain missionary stations in Indian reservations; the purpose of the conference was to promote efficient cooperation between reservation missionaries and reservation superintendents. An outcome of the conference was the sending of a letter to the superintendents by the commissioner suggesting cooperation with missionaries, and a letter of like import to missionaries from their mission boards. In the missionary letter there was inclosed a statement of the aim of "the Indian Service as set forth by the chairman of the United States Board of Indian Commissioners."

The statement referred to reads as follows:

The main points aimed at by the Government in its legislation and the administration of the Indian Service are as follows:

1. The training of all Indians to be self-sustaining, self-respecting American citizens.
2. A practical and vocational educational program which will fit the Indians for absorption into the industrial, agricultural, and social life of the Nation.
3. The promotion of the health of Indians living on reservations by the enforcement of suitable hygienic and sanitary regulations and by adequate medical, surgical, nursing, and hospital service.
4. The enforcement of law and order on all Indian reservations.
5. The opening of opportunities for appropriate work for Indians which will encourage them in full responsibilities for their own advancement.
6. The conservation and utilization of the natural resources belonging to the Indians and the improvement of the economic condition which must underlie social and cultural progress.
7. The improvement of housing conditions by instruction in domestic economy and by using Indian earnings and resources in building better houses and stabilizing family life.
8. The encouragement of Indian arts and industry and the opening of marketing channels for Indian products.
9. It is the policy of the present administration to provide or continue separate Indian schools only where it is impossible to merge the education of Indians in the public school systems of the several States.
10. It is the expectation of the service to help Indian young people who are qualified to go beyond the ordinary school course to seek further education in appropriate institutions of higher or professional training.
11. The Indian Service welcomes the cooperation of the mission boards, the independent societies devoted to Indian welfare, and of public-minded individuals in carrying out this program, and especially in providing the opportunities for religious education and for spiritual culture which can not fall within the jurisdiction of the Government.

THE BUREAU

GENERAL LAND OFFICE

SUMMARY OF THE COMMISSIONER'S REPORT

Growing demands for the public domain.

The depression has in no manner lessened the demand for our remaining public lands. Since 1923 there has been an annual increase in the areas devoted to new uses under the public land laws. Owing to reductions in the list of Indian allotments and in sales of Indian lands, the acreage embraced in original appropriations for the year 1931 was slightly under that of 1930; otherwise the new entries, including homesteads and mining locations, were in excess of last year's showing.

Revenues from sources other than the act of February 25, 1920 (41 Stat. 437), and sales of Indian lands compare favorably with those of recent years. There was a falling off of Indian allotments and sales of Indian lands. The record low price registered by oil, together with other factors affecting the oil industry, resulted in a considerable reduction in amounts realized from the mineral leasing act.

Arrearages.

While not excessive, the arrearages were greater than they were last year. The continuous increase in the work demanded and secured for the ensuing year a small provision for increase in the personnel, and it is believed that in a comparatively short time the work of the office may be brought current.

Fire Protection.

Additional amounts made available for fighting forest fires were the means of a more efficient distribution of our fire-prevention forces.

Receipts and expenditures.

Sales, leases, and other disposition of public lands, etc., resulted in cash receipts totaling \$4,618,255.53 and from sales of Indian lands \$214,423.32, all of which was deposited in the Treasury of the United States. Receipts of the Federal Government from bonuses, royal-

ties, and rentals under the laws providing for the leasing and mineral rights on the public domain aggregated \$3,531,655.05. The largest amounts were obtained from mineral lands in Wyoming, \$2,184,422.88. California was the second State in the amount of receipts with \$870,453.58. Those from other States follow: New Mexico, \$163,432.73; Montana, \$91,596.73; Utah, \$87,813.28; Colorado, \$83,581.14; North Dakota, \$22,627.79; Alabama, \$12,453; Idaho, \$6,092.51; Washington, \$4,907.88; Louisiana, \$3,532.23; South Dakota, \$560; Arizona, \$101.30; Nevada, \$80. These figures do not include \$33,074.09 received as royalties from lands in the State of Wyoming under the act of June 26, 1926, of which the State does not receive a share. Under the provisions of the mineral leasing act of February 25, 1920 (41 Stat. 437), the States secure 37½ per cent of the receipts from bonuses, rentals, and royalties derived thereunder from the public lands within their borders, the reclamation fund 52½ per cent, and the other 10 per cent is paid into the Treasury of the United States and credited to miscellaneous receipts. Subject to final adjustments by the Comptroller general, the amounts received will be distributed as follows: Reclamation fund, \$2,396,605.13; public land States and certain counties within such States, \$1,610,852.37; general fund, \$610,798.03; various Indian tribes, \$214,423.32.

Total expenditures for the conduct of the business of the General Land Office, including expenses of the district land offices (\$276,136.44), amounted to \$2,158,159.81; disbursements from deposits by individuals for surveying public lands (\$29,524.26) and from appropriations and funds for surveying Indian reservations (\$60,152.33) are not included in the foregoing either as receipts or expenditures.

Area of land entered and patented.

The total area of public and Indian lands originally entered and allowed was 5,218,627 acres, not including 91,470 acres embraced in finals not heretofore counted as original dispositions of land. Patented mineral entries embrace 25,627 acres. The stock-raising homestead act of December 29, 1916 (39 Stat. 862), was the means for the entry of 4,201,766 acres. The area patented on original dispositions was 1,938,864 acres, of which 1,058,102 acres were patented with all minerals reserved.

Field service.

July 1, 1930, there were pending in the field for investigation 17,129 cases; 20,594 additional were received; 19,998 were investigated, reported, and closed; and 479 dropped as not constituting separate and individual cases, leaving 17,246 not investigated. Of the report submitted, 12,744 were adverse and 7,254 favorable. The ar-

rearages of 117 cases over last year's total is due to the large number of oil shale and oil placer claims, there being 9,070 such cases. Cash collected by this service and turned into the Treasury, \$25,677.74, due to the activity of the field investigators; 123,431 acres were restored to the public domain representing fraudulent entries, etc. Civil suits brought by the Department of Justice in connection with the activities of the field forces numbered 42, of which 30 were won and 12 lost. Thirteen criminal prosecutions resulted in convictions and in two of these cases prison sentences were imposed.

Cadastral engineering service.

The direct appropriations for this service, amounting to \$703,060, were augmented by other special funds to the extent of \$96,067.60. Surveys or resurveys were made in 21 States and in the Territory of Alaska by 226 groups, of which 54 in 15 States were engaged in resurveys. That part of the work that may be computed on a line basis totals 19,391 miles, the average cost of which was \$18.54 a mile. Surveys of agricultural lands applied for by settlers and the States to accommodate entries under the enlarged and stock-raising homestead acts and to provide for State selections continued to represent in point of volume the major surveying activities of the office. There is a special effort made to complete such current work, because of its importance to the development and progress of the country. It has not been possible in recent years to accomplish this purpose on account of the limitation of appropriations. However, during the year 1931 approximately 2,450,000 acres of these agricultural lands were surveyed. The increase is due partly to the concentration of funds for that purpose and partly to the character of the country. The larger fields of present-day agricultural-land surveys are in the States of Arizona, Nevada, New Mexico, and Utah. There was a continuation of the survey of township exteriors over parts of southeastern Utah to serve as bases for descriptions of oil placer claims and for other location purposes. Extensive surveying operations were carried on in cooperation with the Forest Service, Department of Agriculture, National Park Service, the Geological Survey, the Bureau of Reclamation, the Indian Office, and the Coast and Geodetic Survey. Such work aggregated during the year exclusive of boundary lines in special cases not measurable on a quantity basis approximately 780,000 acres. There were accepted and placed on file plats representing 1,498,888 acres of original surveys of public lands and in addition 816,795 acres of lands resurveyed.

Maps and map making.

The copper plates for the 1931 edition of the map of the United States have been revised and the data thereon brought to date. Prep-

aration is being made for the printing of the map. The State maps of Wisconsin and Wyoming are in the hands of the contractor for printing. Work is progressing upon the recompilation of the map of the State of Idaho, and preliminary steps have been taken to compile new maps of Arizona and Oregon. Two special maps of the Owens River Valley and Mono Lake districts, California, were prepared to show the status of the lands withdrawn for the protection of the watershed supplying water to the city of Los Angeles, and leasing for grazing purposes under the act of March 4, 1931 (46 Stat. 1530). Numerous maps of the public-land States are being prepared for the use of the Department of Justice in connection with suits brought by the Sioux and other Indians. There were sold 21,628 photolithographic copies of township plats, for which \$10,896 was received and 9,168 copies were furnished other departments for official use.

Homesteads and kindred entries.

Original homestead entries approved for patenting numbered 6,199. There were also considered 1,966 applications to make second homestead entry; 934, to amend; 1,028, for leaves of absence and extensions of time; also 9,835 original entries, 19,339 appeals from action of district land offices, etc., making a total of applications for second homestead entries, amendments, extensions of time, leaves of absence, original homesteads, and appeals considered, 33,102. One thousand five hundred and fifty-three public-sales applications received action and resulted in the issuance of 250 patents. There were patented 211 timber and stone applications out of a total of 401 considered during the year. The public lands located in States having no local land offices are disposed of in the General Land Office, and it is difficult to apply the usual unit of measurement to the cases arising in such States.

Restoration and openings subject to the preferences of ex-service men.

Through release from segregation or withdrawal or through survey or resurvey, public lands aggregating 3,698,798 acres and 829,373 acres, respectively, were restored to disposition subject to the preferences accorded ex-service men.

Minerals.

There were 26 oil and gas cases on hand involving leases and relief applications under sections 14, 18, 18 (a), 19, and 22 of the act of February 25, 1920 (41 Stat. 437) and 1,027 cases were received. Ninety-five leases were granted. Section 14 of the leasing act was the authority for the issuance of 90 leases covering an area of approximately 57,600 acres to permittees who showed discovery of oil or gas as result of prospecting under permits. Pursuant to section

17, authorizing the public sale of leases, one lease was issued in the Monroe gas field, Louisiana, for 39.75 acres, on which a bonus of \$596.25 was paid. Two in the Wiley field, Wyoming, one for 519.40 acres, for which \$114,400 was paid, and one for 199.84 acres, on which the bonus paid was \$83,200. There were two in the Baker gas field, Montana, one for 320 acres and the other for 480 acres, on which bonuses amounting to \$4,825 and \$2,450, respectively, were paid. Final action was taken on 40 oil and gas applications, 303 assignments were considered, and 2,563 applications for extensions of time were disposed of. One thousand six hundred seventy-six permits were held for cancellation and 1,655 finally canceled; 5,212 cases were examined on which further action was necessary, leaving 755 pending at the close of the year.

There were on hand 154 mineral entries at the beginning of the year; 697 were received, 686 were disposed of, leaving 155 awaiting action. Of those disposed of, 223 were approved for patent.

Coal.

Thirty applications for coal permits, leases, and licenses were left over from last year; 2,601 were received; 93 coal prospecting permits issued, covering an aggregate of 76,864.04 acres. Thirty-four coal leases, embracing 3,876.47 acres, were granted, and 33 coal licenses for 1,440 acres were given. The total number of cases disposed of was 2,577, leaving 54 for consideration. One potash lease, involving 1,320 acres, and 58 potash permits, embracing 125,678.87 acres, were issued under the act of February 7, 1927. Sodium permits numbering 11 were, pursuant to the act of February 25, 1920, as amended by the act of December 11, 1928, issued for an area of 17,110.25 acres. One sodium lease for 405.20 acres was executed. There were on July 1, 1930, 57 sodium cases on hand; 1,616 were received and 580 disposed of, leaving 93 awaiting action. Miscellaneous mineral cases brought over from last year total 54; 935 were received, 881 adjudicated, thus leaving 108 awaiting action. There were 36 mineral applications pending July 1, 1930; 182 were reported, 186 disposed of, while 32 await action.

Oil shale.

Thirteen field reports on oil-shale locations not embraced in patent proceedings were pending on July 1, 1930; 865 were received, 824 disposed of, leaving 54 for consideration during the next year. Charges were directed against 7,568 locations, embracing approximately 900,592 acres.

Oil-shale contests.

Sixty-four oil-shale contests were on hand at the beginning of the year; 217 were received, 178 of these contests were decided, leaving

103 unadjudicated July 1, 1931. During the year, 1,181 shale locations, embracing approximately 140,539 acres, were declared null and void.

Oil-shale applications for patents.

There were 35 mining applications embracing oil-shale lands on hand at the beginning of the fiscal year for 236 claims, involving approximately 37,604 acres. Five such applications were received for 25 claims, including 3,875 acres; two applications, embracing 11 claims, with a total of 1,750 acres, were rejected; 14 applications for 64 claims, covering 9,800 acres, were allowed, leaving on hand 24 applications for 186 claims, with an acreage of 29,932 acres.

Oil shale mineral entries.

There were 48 entries for oil shale lands for 330 claims, describing 47,662 acres, awaiting action at the beginning of the year; 14 entries were received for 64 claims, including 9,800 acres. Twenty entries were approved for patent, embracing 124 claims for 19,046 acres, leaving without action 42 entries, 270 claims, involving an acreage of 38,416.

Hoover Dam project.

The enactment of legislation for the Hoover Dam project made necessary the examination and adjudication of mineral locations with an area selected for purposes of that enterprise. This has increased the work without adding to the number of employees. On July 1, 1930, 661 field reports were pending and 1,597 cases were received during the year involving lands within the project; 2,115 were disposed of, leaving 43 awaiting action June 30, 1931. There have been 196 contests received in connection with the lands in the project since January, 1931. One hundred and ninety-one were disposed of, leaving five on hand at the end of the fiscal year. Final action on these cases will be had upon receipt of supplemental reports necessary to complete the records. The field service represents that there are approximately 1,000 additional locations for examination, which will require action in this office after reports have been received. A number of patented salt and other mining claims within the area of the project will necessitate appraisal by the field service. The work will require several months time. Hearings will be necessary under proceedings already instituted and those that may be hereafter brought against mining locations. The expenditures of large amounts of money have been required in the publication in most instances of notices of adverse proceedings for the reason that post-office addresses of claimants are unknown, so that publication has been necessary in order to effect service of notice upon the claimants.

Leases.

The act of May 24, 1928 (45 Stat. 728), authorizes the leasing of public lands for use as public aviation fields. Sixty-eight applications under this act were considered, 3 leases were granted, and 1 canceled. The area granted to the city of Rock Springs, Wyo., was 480 acres; to Needles, Calif., 625.56 acres; and to the Mid-Continent Air Express Corporation, 40.53 acres for lands in Santa Fe County, N. Mex. Under authority conferred by the act of July 3, 1926 (44 Stat. 821), 296 applications for fur-farming leases in Alaska were considered, 14 granted, 1 was canceled, and those remaining await reports from the Field Service. The leasing of lands in Alaska for stock grazing purposes is authorized by the act of March 4, 1927 (44 Stat. 1452). Under this act action was taken on 190 cases and 5 leases were granted. Regulations were promulgated in conformity with the provisions of section 2 of the act of March 4, 1931 (46 Stat. 1530), on April 18, 1931, for the control and use of reserved lands in California for grazing purposes. Permission given by the act of March 3, 1925, to lease unreserved public lands in connection with mineral, medicinal, or other springs resulted in the consideration of 13 cases. No leases, however, were granted. Regulations were prescribed on August 16, 1930, having for their purpose the preservation for general public use and benefit the unreserved public lands containing hot springs or springs the waters of which possess curative properties.

State, county, or city recreational areas.

Eleven withdrawals were made by the department for recreational classification under the act of June 14, 1926 (44 Stat. 741), aggregating 4,022 acres based on four county and seven State petitions. Of the withdrawn area, 452 acres are revested Oregon and California railroad lands and withdrawn under the said act as amended by the act of April 13, 1928 (45 Stat. 429). There were sold under the recreational law 3,102 acres to the State of Oregon, 1,149 acres to the State of Colorado, and 80 acres to the town of Encampment, Wyo. The areas leased under the law are as follows: Two hundred and eighty acres to the State of Oregon; 560 acres to Harney County, Oreg.; 171 acres to Dona Ana County, N. Mex.; 11,258 acres to Pima County, Ariz. The area classified as nonrecreational and released from withdrawal was 4,576 acres.

Stock driveways.

Nine new stock driveways were established under section 10 of the act of December 29, 1916 (39 Stat. 862), as amended January 29, 1929 (45 Stat. 1144), and 33 were modified. The area withdrawn totals 25,392 acres and that released from withdrawals, 10,657

acres. The total gross area included in driveway withdrawals at the close of the fiscal year was 9,458,390 acres and is distributed by States as follows: Arizona, 496,864 acres; California, 33,862 acres; Colorado, 214,590 acres; Idaho, 820,706 acres; Montana, 227,237 acres; Nevada, 3,564,647 acres; New Mexico, 1,101,659 acres; Oregon, 452,542 acres; South Dakota, 22,155 acres; Utah, 1,221,662 acres; Washington, 10,919 acres; Wyoming, 1,291,727 acres.

National forests.

Two forests were created and two enlarged under the act of March 1, 1911 (36 Stat. 961). Two were enlarged, 10 reduced, and 2 interforest transfers effected under the act of June 4, 1897 (30 Stat. 34, 36). Five forests were enlarged and 4 reduced by special acts of Congress and 12 were enlarged under the general national forest exchange act of March 20, 1922 (42 Stat. 465). The areas within existing national forests acquired under the act of March 1, 1911 (36 Stat. 961), were 497,444 acres. There were on June 30, 1931, 151 national forests, embracing 185,251,582 acres, of which a little over 85 per cent is public land. The net additions to national forest areas during the year were 1,275,652 acres. Forest withdrawals embrace 354,869 acres, while administrative site withdrawals cover 171,105 acres.

Rights of way.

One hundred and thirty-three railroad rights of way applications were received, which, added to 7 pending on June 30, 1930, make a total of 140. Twenty-seven were approved, 4 canceled, requirements were made in 93, and 11 were otherwise disposed of. Five were not reached for action. Six hundred and ninety-six irrigation, telegraph, telephone, or gas pipe line rights of way applications were received in addition to 14 on hand. One hundred and ninety were approved, 23 canceled, 90 otherwise disposed of, and requirements were made in 400. Seven were not considered. One hundred and ninety-two maps of approved rights of way in forest and Indian reservations were received from the Forest Service and Indian Office. Forty-five memoranda or opinions were submitted to the department on rights of way matters referred to this office for consideration. The number of approved rights of way of all cases awaiting office action July 1, 1930, was 30; those received, 560. Of these, proof of construction was accepted on 159. There were canceled by relinquishment or default, 47. Requirements were made in 200 cases and 129 were otherwise disposed of. Twelve suits were recommended and four decrees of forfeiture obtained as the result of previous recommendation. Thirty-one suits are now pending in the Department of Justice.

Hydroelectric power.

Based on applications made for restoration from power-site withdrawals and classification, 69 restorations in accordance with the terms and conditions of section 24 of the Federal water power act were promulgated during the year. Eighty-nine hydroelectric power project applications were transmitted to the General Land Office by the Federal Water Power Commission, involving public lands and lands within national forests in 12 States and the Territory of Alaska. There were withdrawn during the year 1931 under the Federal water power act 35,644 acres, and prior thereto 2,064,876 acres had been withdrawn under such act.

Reclamation and irrigation.

Federal reclamation projects numbering 30 are located in 14 of the western public-land States, of which number 16 are operated in whole or in part by irrigation districts and water users' associations. There are also five Indian reclamation projects, the irrigation features of which are under the supervision of the Bureau of Indian Affairs; 2,244 entries of various kinds for lands in reclamation projects were received and 1,895 were considered. During the fiscal year there were promulgated 40 orders of restorations and 7 orders of withdrawals under the reclamation act. One change in the form of withdrawals was made and there was one order setting aside certain lands in Nevada for the Boulder Canyon project. The area restored in various States totals 4,555,920 acres and that withdrawn amounts to 1,211,280 acres. There were five openings to entry under the reclamation act and a total of 185 irrigated farm units.

State irrigation districts.

Applications for approval under the acts of August 11, 1916 (39 Stat. 506), and May 15, 1922 (42 Stat. 541), by 73 districts have been presented to this office, and 58 districts, with a gross area of 2,432,258.40 acres, have been approved. Applications by 16 districts, involving 323,408.09 acres, have been finally rejected. Interlocutory action on all districts during the year involved 233,354.43 acres.

Private irrigation projects.

Five reports were received as the result of investigations of private irrigation enterprises upon which claimants and applicants under the desert land law were depending for their water supply, making a total of 1,412 such projects reported on since the adoption of the regulations of September 30, 1910 (39 L. D. 261). There

were also received from the Geological Survey six reports bearing upon the water supply and feasibility of these projects in connection with which investigations have been made.

Desert land.

Three thousand five hundred and forty-nine cases under the desert land law were received and 287 were pending. Of these, 737 were approved, 543 canceled, requirements were made in 1,622, and 848 were otherwise disposed of. Two hundred and four cases were patented. Eighty-six were not reached for consideration.

Carey Act.

Withdrawals, segregations, and patent applications under the Carey Act amounting to 657,537 acres were considered and either interlocutory or final action was taken upon 532,990 acres thereof, leaving 124,547 acres awaiting action. The area now segregated and unpatented is 701,472 acres.

Pittman Act.

Applications numbering 20 under the Pittman Act were pending at the beginning of the fiscal year and 163 were received. Fifty-six were approved, 56 canceled, 27 referred to the Geological Survey as petitions for designation, 31 otherwise disposed of, leaving 13 awaiting office action.

Swamp and overflowed lands.

The acts of March 2, 1849 (9 Stat. 352), September 28, 1850 (9 Stat. 519), and March 12, 1860 (12 Stat. 3), granted the unappropriated public swamp and overflowed lands made thereby unfit for cultivation in 15 of the public land States to the States within which situated. There have been conveyed to the States under these grants 64,068,388.82 acres. In addition, patents have issued for 790,463.23 acres of swamp land as indemnity under the act of March 2, 1855 (10 Stat. 634), and the act amendatory thereto of March 3, 1857 (11 Stat. 251). During the year 7,125.53 acres of swamp and overflowed lands were approved and patented and claims to 135,292.86 acres were rejected or canceled. New claims were asserted during the past year for 144,912.93 acres.

Minnesota and Arkansas drainage.

Consideration was given 99 cases from the State of Minnesota and 2 patents were issued under the act of May 20, 1908 (35 Stat. 169), authorizing the State of Minnesota to extend its drainage laws over the public lands of the United States. Fourteen cases were received for lands in Arkansas under the act of January 17, 1920 (41 Stat. 392), subjecting certain lands in Arkansas to the drainage laws of that State.

Withdrawals and restorations.

Executive or departmental withdrawals issued during the year placed 5,964,797.32 acres of public lands in the state of reservation under various applicable laws for the purposes set forth in the several orders of withdrawal, and there were restored from previous withdrawals 4,920,363.64 acres. Some of the reservations were in the nature of blanket withdrawals without taking into account lands within the exterior limits of such withdrawals had been theretofore entered or patented. The totals, therefore, do not represent with absolute accuracy the area of public unentered or undisposed of lands affected. The nature of the withdrawal or reservation and the acreage affected follow.

Stock driveways.

Withdrawn, 25,392 acres, and restored, 10,657 acres.

Air navigation sites.

Withdrawn, small areas of public land aggregating 10,540 acres in Arkansas, California, Idaho, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming for use by the Department of Commerce as beacon sites or intermediate landing fields in the maintenance of air navigation facilities; restored, 1,960 acres.

National forests.

Withdrawn, 198,450 acres; restored, 2,000 acres.

National monuments and parks.

The additions by way of withdrawals to national monuments and parks from the public domain amounted to 1,616,116 acres; 2,030,440 acres were withdrawn for monument or park classification, and there were restored 1,960 acres.

Recreational.

Public lands to the extent of 4,022 acres were withdrawn for recreational classification at the instance of States or counties, and there were restored 4,576 acres.

Wild life refuges.

The addition to wild life refuges from the public domain amounted to 30,771 acres. Withdrawals for classification affected 4,360 acres.

Los Angeles, Calif., water supply.

Lands within the Owens Valley and Mono Lake Basin, Calif., were, beginning last and continuing this year, withdrawn by Executive orders to protect the water supply system of the city of Los Angeles. These withdrawals were followed and superseded by the

act of Congress approved March 4, 1931 (46 Stat. 1530), withdrawing the lands, together with others, amounting to approximately 400,000 acres.

Coal.

Seventeen thousand two hundred and eighty acres of coal lands were withdrawn and 176,752 acres theretofore withdrawn were restored.

Oil.

Ninety one thousand five hundred and twenty acres were reserved for classification and in aid of the administration and control of the Government owned oil and gas deposits; 15,189.89 acres heretofore withdrawn were restored.

Power site reserves.

One thousand six hundred and eighty-seven acres were withdrawn for power-site purposes and 52,187 acres were restored to entry, leaving in power-site reserves on July 1, 1931, 2,412,210 acres.

Classified hydroelectric areas.

Eighteen thousand three hundred and fifty-five acres were classified as valuable for hydroelectric power purposes and 5,668 acres were restored to entry. In all there have been classified and reserved from entry 1,594,369 acres.

Public water reserves.

Ten thousand four hundred and eighty acres were withdrawn as public water reserves and 2,405 acres theretofore withdrawn were restored to entry. On July 1, 1931, there were 427,774 acres held in public water reserves in 12 States in addition to lands surrounding springs and water holes.

Reclamation.

One million two hundred eleven thousand two hundred and eighty acres were withdrawn for reclamation purposes and 4,555,920 acres were restored from such withdrawals.

Contests.

Contest cases before the office for consideration total 3,180, and of these 2,598 were decided, leaving 582 for future action.

Indians and Indian lands.

Section 4 of the act of February 8, 1887 (24 Stat. 388), as amended, provided for the allowance of allotments to Indians not residing upon reservations. There were 1,684 cases of this character considered and 384 patents issued. Applications in 2,396 cases for fee and trust patents for the benefit of Indians were considered and 1,172

fee and 188 trust patents issued. The compilation of data concerning ceded Indian reservations involved in suits before the Court of Claims has progressed. The claim of Great Sioux upon which the office has been working for several years has been finally rechecked under cooperative agreements with the General Accounting Office and the Department of Justice and report has been made on the Shoshone claim. Almost a score of other claims are pending and will be examined in the order suggested by the Department of Justice.

Pueblo Indian lands.

Patents to non-Indians may issue under the act of June 7, 1924 (43 Stat. 636), for lands within the tracts confirmed and patented to the Indian Pueblo Corporation in New Mexico. Patents have issued in 10 such cases. The exchange of privately owned land situated within the exterior limits of any reservation under the act of April 21, 1904, for nontimbered, surveyed public lands in the same State was considered in 268 cases and patents issued in 33.

Ceded Indian lands.

Consideration was given 3,049 cases involving ceded Indian lands and 65 patents were issued. The cases involved sales and entries in the following reservations: Cheyenne River and Standing Rock, Colville, Coeur d'Alene, Crow, Flathead, Fort Berthold, Fort Hall, Fort Peck, Kiowa, Comanche, Apache, Wichita, Pineridge, Pyramid Lake, Rosebud, Round Valley, Shoshone, Umatilla, and Uintah.

Chippewa logging.

Four timber contracts involving sale of timber on ceded Indian lands in Minnesota are outstanding, three of which have been heretofore extended until July 1, 1932. These four contracts involve 32,362,000 feet of pine timber. Chippewa logging matters were considered in 11 cases.

State grants and State selections.

Selections of school lands, including new selections and those in connection with which requirements had been made, approximating 357,772 acres, were received, which, in addition to 84,287 acres on hand at the beginning of the year, total 442,059 acres. Of this amount 109,267 acres were approved and title conveyed to the States. Lists embracing 5,111 acres were canceled and requirements were made affecting 352,691 acres.

Quantity selections under grants for specific purposes.

New selections for 62,536 acres and those in connection with which requirements had theretofore been made, embracing 231,108 acres, together with 32,764 acres not heretofore accounted for, were consid-

ered; 89,180 acres were approved and title conveyed to the States; 3,898 acres were canceled; requirements were made as to 161,081 acres. Deeds were accepted from the State of Nevada conveying to the United States 27,000 acres of State-owned lands in furtherance of exchange grant of 30,000 acres made by the act of June 8, 1926 (44 Stat. 708). Conveyances amounting to 15,959 acres were made to the State, with reservation of certain mineral deposits. Title to 11,587 acres was conveyed to the States under cooperative agreements providing for the exchange of school-section lands within the boundaries of national forests. The act of January 25, 1927 (44 Stat. 1026), granting mineral school sections to the several States made it necessary for the office to determine whether the various school sections passed to the State under the original granting act as nonmineral or under the provisions of said act of 1927 as mineral lands; 136,873 acres of school-section lands were listed, which with 211,192 acres on hand total 348,065 acres; 171,457 acres were disposed of, while 176,608 acres were not reached for consideration.

Railroad grants and selections.

Railroad and wagon-road lists and selections were received to the extent of 130,025.34 acres; 112,108.67 acres were certified or patented in satisfaction of such grants; 2,278.35 acres of selections were rejected. The total acreage adjudicated was 133,980.87 acres.

Northern Pacific Railroad Co.

The act approved June 25, 1929 (46 Stat. 41), altered and amended the land grants to the Northern Pacific Railroad (now Railway) Co., under the act of July 2, 1864 (13 Stat. 365), and the joint resolution of May 31, 1870 (16 Stat. 378), declared forfeited certain claimed rights of the company and directed the institution and prosecution of proceedings looking to the adjustment of grants and for other purposes. The suit authorized by said act has been instituted by the Attorney General in the District Court of the United States for the Eastern District of Washington. Responding to requests of the Attorney General, maps, diagrams, copies of papers, and approximately 50 tabulations covering some of the points involved in the grants to the Northern Pacific Railroad Co. were prepared and transmitted to the Department of Justice.

Railroad adjustment.

The work of adjusting the following seven railroad land grants was completed: Minneapolis & Cedar Valley, Winona & St. Peter, Southern Minnesota, Southern Minnesota Extension, Hastings & Dakota, Lake Superior & Mississippi, and Union Pacific Railroad Cos. All of these adjustments, except that of the Union Pacific, were approved by the Secretary and the grants closed. The Union Pacific

adjustment has been approved but the grant has not been closed. The work of adjusting the above grants necessitated a careful tract book, survey plat and grant plat examination of each smallest legal subdivision, on approximately 26,000,000 acres of granted and indemnity land. The adjustment of another grant is progressing rapidly and five of those reported as completed last have been approved by the Secretary and the grants closed.

Revested Oregon & California Railroad and Coos Bay Wagon Road grant lands.

The act of June 9, 1916 (39 Stat. 218), revested in the United States title to certain lands formerly granted to the Oregon & California Railroad Co. and provided that the land should be listed into three groups or classes, to wit: First, power site; second, timber; and third, agricultural. The lists made under said act and the status of the land June 30, 1931, were as follows:

1. Power site, 57,143.23 acres, containing 825,754,000 feet b. m. of timber, were embraced in power projects or withdrawals for power site purposes. The Federal Water Power Commission has jurisdiction over these projects and withdrawals but the timber on the land is subject to sale under the act of June 4, 1920 (41 Stat. 758).

2. Timber lands, 2,886,327,000 feet b. m. of timber on 95,963.29 acres have been sold or patented to private individuals and corporations; 30,585,257,000 feet b. m. of timber on 1,132,062.61 acres remain unsold.

3. Agricultural lands, 1,069,279.72 acres, have been classified as agricultural in character, with the present status as follows:

(a) 205,418.78 acres patented.

(b) 79,091.29 acres embraced in pending entries.

(c) 771,426.05 acres vacant but subject to entry.

There have been withdrawn 2,757.56 acres for recreational purposes at the instance of municipalities or the State of Oregon under the acts of June 14, 1926 (44 Stat. 741), and April 13, 1928 (45 Stat. 429). The foregoing does not embrace the areas within indemnity limits of the grant to the Oregon & California Railroad Co., which at the date of the revestment act of June 9, 1916, were unsurveyed and included in national forests. These lands are discussed under item 13-k in the decree of September 15, 1925, of the District Court of the United States for the District of Oregon in the case of *United States v. Oregon and California Railroad Company* (8 Federal Reporter, 2d series 645). With the exception of 1,120 acres, these lands are now surveyed and the total acreage has been found to be 526,884.18 acres. Such lands have not been cruised or classified and no information as to their character and value can be furnished. They were, however, before survey paid for as revested lands at the

rate of \$2.50 per acre in conformity with such court decree. The total receipts from these lands aggregate \$6,967,932.26. The expenditures in connection therewith have been as follows: To the railroad company (\$2.50 per acre), the Central Union Trust Co. and on account of judgments against the railroad company, \$4,102,215.28. Taxes and money in lieu of taxes paid: Taxes, 1913, 1914, and 1915, \$1,571,044.05; money in lieu of taxes, 1916 to 1926, \$7,135,283.36; money in lieu of taxes since 1926, \$1,992,600.85. Total for taxes or money in lieu of taxes, \$10,698,928.26. Amounts by which payments exceeded receipts, \$7,833,211.28.

Revested Oregon & California Railroad grant lands within the Lakeview and Roseburg land districts in Oregon comprising 4,579.99 acres were restored to homestead entry during the fiscal year June 30, 1931. Sales of timber on the revested lands were made during the year for 5,130.22 acres, containing 156,151,600 feet b. m. of timber, for which the sum of \$256,559.55 was received. Total sales to date, 795, involving 106,187.22 acres, containing 2,359,977,980 feet b. m. of timber, for which the sum of \$5,909,149.64 has been realized.

Reacquired Coos Bay Wagon Road grant lands, act of February 26, 1919 (40 Stat. 1179).

The lands acquired from the Southern Oregon Co., formerly granted to aid in construction of the Coos Bay Wagon Road, have been classified as follows:

1. Power sites, 5,110.87 acres. These power-site lands contain 181,460,000 feet b. m. of timber. The timber, however, is subject to sale under the act of June 4, 1920 (41 Stat. 758).

2. Timber land, 55,803.77 acres, containing 2,177,302,000 b. m. of timber. Of this, 14,908.83 acres, containing 608,749,000 feet of timber, has been sold to private individuals and corporations under the various applicable acts, leaving 40,894.94 acres, with a stand of 1,568,553,000 feet b. m. of timber, unsold.

3. Agricultural lands, 31,380.15 acres, have been classified as agricultural. Of this area, 8,841.15 acres have been patented, 5,927.48 acres are embraced in pending entries, 16,609.52 acres are vacant.

Receipts from proceeds of sale of lands, timber, etc----- \$1, 696, 819. 33
Disbursements:

Paid Southern Oregon Co-----	232, 463. 07
Paid Coos and Douglas Counties for taxes-----	547, 220. 95
Distributed to Coos County under sec. 5 of the act-----	225, 530. 98

Reconveyed Coos Bay Wagon Road grant lands restored to entry during the present fiscal year.

Reconveyed Coos Bay Wagon Road grant lands in the Roseburg land district, comprising 1,640 acres, were restored to homestead entry during the fiscal year, which, with other restorations hereto-

fore reported, make a total of 31,378.15 acres. This total includes 8,641.15 acres of patented agricultural lands, 5,927.48 acres embraced in pending agricultural entries, and 16,489.52 acres of vacant agricultural land. There were sold under the provisions of the act of June 9, 1916 (39 Stat. 218), February 26, 1919 (40 Stat. 1179), and May 17, 1928 (45 Stat. 597), during the fiscal year 200 acres of lands containing 11,320,000 feet b. m. of timber for which the sum of \$20,710 was received. Total sales to date 96, involving 17,220.78 acres, containing 686,072,000 feet b. m. of timber, for which \$1,592,-614.84 has been received.

Oregon-California tax unit, act July 13, 1926 (44 Stat. 915).

Payment to 18 counties in Oregon of amounts of money in lieu of taxes, involving approximately 2,300,000 acres of land, title to which revested in the Government under the act of June 9, 1916 (39 Stat. 218), is made by the United States under the act of July 13, 1926 (44 Stat. 915). The rates are fixed by the lawful annual levies on privately-owned lands in the several counties and the valuations are those used by the Secretary of the Interior in the payment of the accrued taxes for the year 1915. The counties present their claims annually and they are checked and audited by this office, and certified for payment if found correct. It is necessary to determine from the records and the proofs submitted not only the State and county tax but also whether the land is subject to the school, high school, road, port, or other special district tax claimed. A special set of records are kept where each disposal of revested land is noted. The auditing and adjudication of the claims has resulted in net deductions on all claims, or savings to the Government of approximately \$307,500.

Following is a résumé of claims on hand July 1, 1930, and of the claims received and disposed of during the fiscal year 1931:

Claims pending July 1, 1930

1 claim, year 1926-----	\$4, 446. 5824
1 claim, year 1927-----	3, 284. 7513
1 claim, year 1928-----	3, 389. 051
4 claims, year 1929-----	220, 686. 01
 Total-----	 231, 806. 3947

Claims received, fiscal year

9 claims, year 1929-----	\$162, 322. 96
13 claims, year 1930-----	451, 451. 39
 Total-----	 613, 774. 35

Claims certified, fiscal year

1 claim, year 1926-----	\$3, 855. 5751
1 claim, year 1927-----	3, 491. 0575
1 claim, year 1928-----	3, 291. 3962
13 claims, year 1929-----	376, 004. 26
4 claims, year 1930-----	196, 780. 95
<hr/>	
Total-----	583, 423. 2388
Net disallowance in above claims-----	7, 451. 5959
9 claims, year 1930, pending at end of fiscal year-----	254, 705. 91

NOTE.—Five claims for the year 1929 were certified during the fiscal year 1930 in the sum of \$205,086.51, which was \$56.53 less than the amount claimed.

Town sites, parks, and cemeteries.

Sales of town lots were conducted in the town sites of Anita, Ballantine, and Huntley, Mont.; Warren, Acequia, and Rupert, Idaho; Tule Lake and Napa, Calif; Eastline, Nev.; and Nenana, Alaska. Consideration was given 714 town-lot cases and 207 lots were patented. Action was taken concerning 48 town sites and two town-site patents were issued. The old town site of Pensacola, Fla., presented nine cases for consideration under the act of January 12, 1925 (43 Stat. 738). A contest between stock-raising homestead applicants and the city of Phoenix, Ariz., was decided, and an injunction was issued restraining persons from improperly using for pasturage and grazing the camping grounds near Havre, Mont.

Alaska.

Forty-three cases were adjudicated affecting the sales of lands in Alaska for trade, manufacturing, or other productive industry under the act of May 14, 1898 (30 Stat. 413). Two important cases involving Alaska timber were considered. In one an extension of time was granted in which to complete a contract involving approximately 40,680,000 feet of commercial timber and 207,200 cords of pulpwood in the Susitna Valley. The other was the approval of a contract covering approximately 40,000,000 feet of birch timber from about 64,000 acres of land on the west side of Knick Arm, opposite Anchorage.

New laws.

Memoranda of proposed reports were prepared and submitted on 77 bills pending before the committees of Congress; 72 public or private acts affecting the activities of the General Land Office became laws through the approval of the President. Regulations affecting 66 such acts were promulgated.

Repayments.

Accounts numbering 130 were stated, allowing repayment of \$15,031.87. Rejections included 137 claims. Indian reservation lands were involved in two cases.

Timber, coal, and turpentine trespasses.

The Government received and accepted as damages \$23,164.32 in the adjudication of 1,664 acres involving trespasses on the public domain. Judgments were obtained in six court cases tried and a number of other suits were recommended. Consideration was given 74 cases of unlawful inclosures under the act of February 25, 1885 (23 Stat. 321). Several thousand acres of public lands were released from these inclosures through the removal of fences.

Private land claims.

Much legislation was enacted in the early history of this country concerning disputes and claims arising from private grants of lands from Great Britain, Spain, France, and Mexico for lands now in the United States. As a rule all claims involving private lands have been adjusted either through allowance or rejection, but since 1926 many applications to make homestead entry have been filed at the Los Angeles, Calif., land office for areas embraced in confirmed and patented private land claims. The rejection of hundreds of such claims did not prevent the filing of new ones, in many instances for the identical tracts involved in previous rejections. It having developed that the filing of such applications and the prosecution of appeals from their rejection were being used simply as a cloak to secure court expense money from the applicants who received no benefits and could hope for no benefit through the filing of such applications, that an order was issued by the Commissioner of the General Land Office with departmental approval directing the register at Los Angeles, Calif., to return all such applications, together with any money tendered therewith, to the person from whom received, and to advise him or them that the land was not within the jurisdiction of the land office and that such applications could not be received.

Exchanges.

There were 220 cases arising under the exchange act of June 4, 1897 (30 Stat. 36), adjudicated and 39 patents issued. Consideration was given to 913 cases effecting forest consolidations under the act of March 20, 1922 (42 Stat. 465), as amended by the act of February 28, 1925 (43 Stat. 1090). Extended consideration was given to proposed exchanges for privately owned lands situated in Lincoln

National Forest, N. Mex.; the migratory bird refuge, Bear River, Utah; Lassen Volcanic National Park; Craters of the Moon National Monument; the Petrified Forest National Monument; the Chaco National Monument. Fourteen cases for selections under the act of January 22, 1922 (42 Stat. 359), were disposed of.

Equitable adjudication.

The Commissioner, in conformity with the provisions of section 2450, United States Revised Statutes, as amended by the act of September 22, 1922 (42 Stat. 857), decided upon principles of equity 1046 cases which were duly confirmed by the Board of Equitable Adjudication.

Timber.

There were 11 sales of dead and down timber outside national forests under the act of July 3, 1926 (44 Stat. 890); 112 cases were presented under the acts of June 3, 1878 (20 Stat. 88), March 3, 1891 (26 Stat. 1093), and acts amendatory, authorizing the free use of timber resulting in the grant of 11 permits and the cancellation of 5. The remaining cases await field report.

Abandoned military reservations.

Disposition was made of 174 cases involving lands within abandoned military reservations under the acts of July 5, 1884 (23 Stat. 103), and August 23, 1895 (28 Stat. 491). There were granted 15 homestead and 9 sales patents. All the land in the abandoned Fort Sumner Military Reservation, N. Mex., was sold at public auction.

Cash and credit entries, military bounty land warrants, soldiers' additional, and scrip cases.

There were adjudicated 31 cash and credit entries with the issuance of 18 patents; 17 military bounty land warrants, 1 patent; 784 soldiers' additional, 61 patents; 162 scrip cases, 3 patents.

Small holding claims, quitclaim deeds, and back preemptions.

One hundred and twenty-two small holding claims were decided, resulting in 20 patents. Forty-one applications for quitclaim deeds were presented and 15 issued. Three patents were granted for old back preemptions in Louisiana.

Color of title.

The acts of December 22, 1928 (45 Stat. 1069), February 16, 1929 (45 Stat. 1188), and April 15, 1920 (41 Stat. 553), providing for the issuance of patents where the lands had been held in peaceful adverse possession under claim or color of title for long periods of time, were the bases for the presentation of 295 cases, in connection with which 29 patents were issued.

Erroneously meandered areas.

Applications numbering 145 were submitted to the office during the year under the provisions of the acts of February 27, 1925 (43 Stat. 1013), and September 21, 1922 (42 Stat. 992), providing for the disposition of areas originally returned as water covered, but subsequently found to be fast lands. Nine patents issued.

Stock-raising homesteads.

Patents with a reservation of all minerals to the United States were issued on 2,462 final stock-raising homestead entries for 1,051,-593.21 acres. Prior to July 1, 1931, 60,071 final stock-raising homestead entries, embracing an area of 22,341,253.90 acres, were passed to patent.

Reserved deposits.

Including those during the present fiscal year, patents have issued with a reservation of all minerals or some particular mineral to the extent of 34,610,838.20 acres.

Remaining public domain.

The vacant lands subject to all applicable public land laws are 177,101,551 acres. Of this area 127,265,885 acres are surveyed and (estimated) 49,835,666 acres unsurveyed. The foregoing does not include any public land situated in the Territory of Alaska or embraced in an Indian reservation, a national forest or park, or withdrawn for stock driveway or other public purpose.

National forest lands.

A close estimate places the area of public lands within the exterior limits of national forests, exclusive of Alaska, that are subject to all the provisions of the mining laws, including the general mineral leasing act, and to possible certification by the Secretary of Agriculture for restoration to homestead entry under the act of June 11, 1906 (34 Stat. 233), at 134,000,000 acres.

Recapitulation public land resources

	Acres
Vacant lands subject to all applicable public land laws-----	177, 101, 551. 00
National forest land subject to all mining laws and possible homestead entry-----	134, 000, 000. 00
Stock-raising homesteads, all mineral reserved-----	22, 341, 253. 90
All mineral reserved in patents under various acts other than stock-raising homestead law-----	83, 783. 06
Coal reserved-----	10, 691, 715. 27
Oil, gas, phosphate, or specific mineral reserved-----	1, 562, 092. 78
Stock driveway withdrawals conditionally subject to the mining laws-----	9,458, 390. 00
Total subject to all or some applicable public land laws--	355, 238, 786. 01

Lands in Alaska and those in Indian, military, or naval reservations are not included in the foregoing recapitulation, nor does such table embrace areas in national parks or other reservations or withdrawals for public purpose. The lands in national forests not now subject to any disposition under the public land laws are also excluded from the table.

Existing entries, selections, locations, etc., on June 30, 1931, covered 24,241,042 acres.

OFFICE OF INDIAN AFFAIRS

SUMMARY OF THE COMMISSIONER'S REPORT

Emphasizing the importance of the economic status of the home life of the Indian, the Office of Indian Affairs has during the past year attempted to lay a foundation on which to build its various social and economic programs for the future.

A reorganization of the Washington office was announced on March 30, 1931. Trained and technically qualified executives have been placed as administrators at the head of the five field divisions of the office. Already there are definite indications that the office is more readily responsive to the needs of the field. With the cooperation of the Congress; of Federal, State, and local governmental services; and of semiofficial and voluntary organizations, the Indian Bureau has been enabled to go forward with its complex educational task.

Following the present educational policy to change, as far as possible, the established institutional conception of education to one that is local and individual, the education division records show that at the end of the school year in June, 1931, more than 43,000 Indian children were reported in public schools. Contracts for tuition made with public school districts advanced from 900 to nearly 1,000 during the year and if to these are added the numerous districts in Oklahoma aided by special appropriation the Federal Government had tuition arrangements with 2,568 school districts, involving 36,753 children, which is an increase of 341 districts and 10,055 pupils over the year before.

The three boarding schools—Mekusukey, Okla.; Fort Bidwell, Calif.; and Fort Mojave, Ariz.—which were closed during the year had ceased to fill any real need and would have had to be built up at needless expense. As a result of the cooperation between local and Federal officials the number of days annually attended by Indian children among the Seminole Indians in Oklahoma was three times as great in the school year 1930-31 as it was in 1929-30. Grades below the fourth are no longer carried in seven of the largest boarding schools and four of these now enroll no pupils below junior and senior high-school grades. Three-fourths of the pupils in the so-called "nonreservation" boarding schools were in junior and senior high-school grades during the past year as compared with one-half in the year before. Development of special supervision in

elementary education, secondary education, home economics, and trade and industrial training has gone forward. The educational program on several of the most important and difficult jurisdictions—namely, Pine Ridge, S. Dak.; Pima and Papago, Ariz.; and Turtle Mountain and Fort Totten, N. Dak.—has been placed under the supervision of newly appointed professionally qualified superintendents of education on reservations. One of the most significant features in Indian education has been the development of the consolidated Indian school at Turtle Mountain, N. Dak. It is an interesting cooperative effort between the Federal Government and the State of North Dakota.

Before the close of the fiscal year professionally equipped educators were selected to fill vacancies as superintendents of some of our larger schools. These new superintendents are seeking to build their work on the educational needs of the immediate region in which they are located.

The establishment of the position of "visiting teacher" (school social worker) to work between the home and the school has been an important step in the effort to relate education more closely to the home. The 1932 budget made eight such positions possible, and the first trained visiting teacher in the Indian Service went on duty at Lac du Flambeau, Wis., just after the close of the year.

The old courses of study have been discontinued and State courses of study have been suggested but are to be by no means rigidly followed. Teachers of young Indian children, especially in day schools, have been encouraging children to use what they find in their daily life, writing about themselves, depicting in color their own customs, telling their own legends, and talking about their own economic and social activities.

Among the Pueblos three native teachers are now employed to teach the arts and crafts. It is hoped that we can continue in the future this policy of instructing Indian children in their own culture, by their own people. At the Milwaukee meeting of the National Council of State Superintendents and Commissioners of Education in December, 1930, a resolution was adopted favoring cooperative effort on the part of the State and Federal Government to secure for Indians at all times favorable living conditions, health, and good education. Following the suggestions of the committee which prepared this resolution, the Indian Office appointed a State supervisor of education in Oklahoma, as this State has by far the largest number of Indians.

There have been welcome signs of initiative on the part of Indians to free themselves from dependence. The Choctaws recently arranged that the Indian Office should take no action regarding the

education of their children without first consulting the tribe. The principal chief of the tribe has drawn up a plan whereby Choctaw children, particularly orphans, may be educated in public schools. The plan is to place children in families of other Indians, and, while it contains some things that are difficult, it is significant that the Choctaws are determined to have a part in planning for their own future.

Additions and changes in personnel in existing Indian schools have been made possible by increased appropriations. Requirements have been raised for elementary teachers positions and the entrance salary has been increased. Standards have been raised in the home economics, the girls' adviser, and matron positions.

Increased enrollments in primary grades and a successful effort to provide a full day instruction in elementary grades made necessary during the past year the establishment of 38 new elementary teacher positions, 22 in boarding schools, and 16 in day schools. New positions in the field of vocational education have been set up. Positions as head of industrial training departments in the larger schools have been established in seven schools. Eight shop instructors for senior high schools and seven special instructors for junior high schools have been appointed. Special summer courses were provided early in the summer of 1931 for teachers of industrial subjects. "In-service" teacher training courses have been organized in some of the larger schools. In addition to the new trade and industrial positions, teachers of physical education, music, and fine arts were made possible by congressional appropriation for 1932.

Due recognition has been given to employees already in the service, provided their work was good and their attitude toward Indian people sympathetic. A number have been reallocated to positions paying higher salaries, and it is hoped that all deserving employees can eventually be recognized.

More has been accomplished in securing employment for Indians than seemed possible. Employment work of one kind or another was carried on in 10 locations in 1931. Placements numbering 3,318 were made, of which two-thirds were temporary. This is creditable showing if the comparatively small total Indian populations and the marginal character of most Indian employment are taken into account.

A new Government loan fund has been established to secure higher education for specialized training for qualified Indian youths. A number of young people with outstanding records have taken advantage of it.

In March, 1931, the responsibility for education of natives in Alaska was transferred to the Office of Indian Affairs. This ad-

ministrative change is particularly important as an indication of a policy whereby the Nation is attempting to make a program involving various indigenous groups. In contrast to the Indian Service with its boarding schools, the office of education in Alaska until very recently confined its efforts to local community schools and a program of education that took into account the health, social, and economic life of the natives. It was the other extreme from the Indian policy in the States. Now the Indian Service has the opportunity to compare the results and utilize the advantages of both.

A larger number of Indians sought medical and hospital relief, and considerable progress was made in general preventative measures, sanitation, etc. An increased number of public health or field nursing positions have been established, and the medical personnel of agency, school, special physicians, and others are working toward the fuller development of public-health activities. The committee on Indian affairs of the State and provincial health authorities of North America continues its whole-hearted cooperation toward the development of cooperative measures with the various States where the Indian lives.

Tuberculosis, trachoma, diseases of infancy and childhood are still major problems. Many of the general hospitals have extended their facilities to make further provision for the care of Indians suffering from tuberculosis. The educational program on the part of medical directors, physicians, and field nurses dealing with the factors which have to do with disease prevention and the maintenance of good health have been continued. Special effort has been made along these lines in dealing with those suffering with tuberculosis and other general dietary situations.

The increasing number of live births in Indian Service hospitals has been a very encouraging feature of the medical service. During 1931, 1,356 live births were reported as compared with 1,099 in 1930. The total number of patients treated in hospitals and sanatoriums increased from 38,536 in 1930 to 39,995 in 1931. The total number of days of hospital treatment was 866,507 in 1931 as compared with 768,160 in 1930.

Approximately 30,000 examinations for trachoma were made by special physicians, not including examinations made by hospital, agency, and school physicians. Over 4,000 were diagnosed as positive, a percentage of 13.8. There were 330 surgical operations performed on trachoma cases and other treatments total 2,175. The group of special physicians have also been increasingly active in the treatment of other surgical conditions and in emphasizing the value of the educational phase of their work as carried on in their daily contact with the Indians suffering from trachoma or allied conditions. The number of cases of impetigo increased nearly 100 per cent

during the year and there was a slight increase in the number of cases of scabies. There were 377 fewer cases of measles than the year before. There were 390 fewer cases of whooping cough than in 1930. On the other hand there were 2,903 more cases of influenza than in the previous year. Chicken pox showed an increase of 466 cases; cerebrospinal meningitis increased 43 cases; infantile paralysis showed an increase of 6 cases, while the decrease in the cases of small pox was about one-half of those reported for 1930. There were 29,437 vaccinations and inoculations for various diseases.

There were 6 hospitals completed during the year, adding 237 beds; 7 hospitals have been authorized for 1932, on all of which preliminary estimates and plans are being made or construction is already under way. There were also additions in 1931 to 5 of the existing hospitals or sanatoriums. The gratuity appropriation for health purposes for the year showed a net increase of \$479,400 over 1930.

Organization of the division of agricultural extension and industry was effected during the past year for the express purpose of rendering more direct assistance to the Indians in the solution of their home and economic problems. The field staff of this division consists of a director, 4 supervisors of extension, 23 agricultural extension agents, 10 home extension agents, 221 farm agents or farmers, 62 stockmen, and 40 dairymen. Definite agricultural and home programs are being developed by the agricultural extension agents and the home extension agents. Special emphasis was placed during the past year on home gardens and the increase in the number of gardens was very noticeable. On the Standing Rock Reservation, as a result of the extension campaign for more gardens, 497 of the 618 families on the reservation planted gardens. Many of the extension agents in other jurisdictions were equally successful. More than 2,000 head of purebred and high-grade livestock were selected during this year for the Indians by extension representatives. Several hundred inferior cows have been removed from school dairy herds and have been replaced by higher grade and more profitable types. The extension division has fostered the organization of farm chapters. These organizations vary in membership from a few hundred on small reservations to several thousand on others. The Southern Navajo Agency, in Arizona and New Mexico, has a membership of 2,600. Many of these chapter organizations have built their own community houses in which to carry on the various activities of this type of organization.

More than 147 demonstration meetings were held and 6,584 Indians attended. The extension division is cooperating with the Extension Services in the various States and counties conducting 4-H club work with the Indian boys and girls.

On March 21, 1931, a new director of irrigation was appointed, and this division has been reorganized under his supervision. The organization now consists of a small administrative section in the Washington office and a technical field force at Denver, Colo. The field is divided into four districts reporting through the Denver office. Under these districts are operated 45 irrigation projects. These projects are either large enterprises of 50,000 or more acres, or groups of separated irrigated areas under one project manager. The technical personnel numbers 102; other employees, foremen and laborers number from 300 to 800, depending on the irrigation season.

In the six major irrigation projects over 300,000 acres are now under actual cultivation. The Indians cultivate 20 per cent of this area, lessees from Indians 25 per cent, and white owners 55 per cent. On the smaller projects the situation is somewhat reversed. There were 90,000 acres farmed on the 150 smaller projects during the past year, of which 63 per cent was farmed by the Indians, 26 per cent by lessees, and 11 per cent by white owners.

Due to the general business depression, the production of lumber from timber cut on Indian lands declined greatly during the year. A comprehensive survey of range resources, existing policy of administration, and various other phases of forestry work among Indians has been made. It is hoped that complete reports covering various reservations will aid materially in outlining and putting into effect a plan for much needed range conservation. More liberal appropriations for forestry activities on Indian reservations have permitted improvements greatly increasing the efficiency of fire protection and administration of these valuable assets.

For 1931 the total appropriations from the Federal Treasury aggregated \$21,723,199.25, including certain items carried in deficiency acts. This represents an increase of \$2,846,317.43 over the gross amount of \$18,876,811.82 available for the previous year. Authorization from tribal funds for 1931 aggregated \$3,600,989.17, or \$1,125,800.69 less than the gross amount of \$4,726,789.86 available for 1930. The major portion of this decrease is accounted for through a large appropriation in 1930 for industrial purposes. The balance represents largely depletion of tribal funds usually available for support purposes. For 1932 the total sum chargeable to the Treasury is \$26,275,496.73, or an increase of \$4,552,297.48 over the amount for 1931. Included in this increase, however, is a total of \$1,243,000 for education and medical care for natives in Alaska, this work having been transferred to the Indian Service on March 15, 1931, pursuant to authorization contained in the second deficiency appropriation act approved March 4, 1931. Tribal fund authorizations were further decreased for 1932 by \$271,025.19, the gross total for the year being \$3,329,963.98.

Reorganization of the probate work among the Five Tribes was made in the Muskogee office.

The American Red Cross assisted most helpfully in the relief of destitute Indians among the Five Civilized Tribes in Oklahoma during the winter of 1930-31.

One of the most important pieces of legislation passed during the year was the act of March 4, 1931, canceling irrigation reimbursable charges against Indian lands expended prior to June 7, 1924, on irrigation works on the Gila River Reservation. These Indian lands were relieved of nearly \$1,400,000 that, prior to the enactment, was a lien against the lands. An effort was made during the last session of the Congress to obtain additional legislation dealing with restrictions affecting the Indians of the Five Civilized Tribes, but unfortunately the bill failed to pass the Senate.

OFFICE OF EDUCATION

SUMMARY OF THE COMMISSIONER'S REPORT

The Office of Education is primarily an establishment for educational research and the dissemination of data on education. It has no administrative functions except those connected with the expenditure of the funds appropriated by the Federal Government for the maintenance of colleges of agriculture and the mechanic arts in the several States, and in Alaska, Hawaii, and Porto Rico.

Since the last report of the Secretary of the Interior, in 1930, the educational and medical services for the natives of Alaska were transferred, under authority of Congress, to the Commissioner of Indian Affairs, which transfer took from the office the veteran assistant chief of the Alaska service, Dr. William Hamilton, and the assistant chief clerk and accountant, D. E. Thomas.

During the fiscal year ended June 30, 1931, the three nation-wide surveys of the office, namely, those of secondary education, the professional education of teachers, and school finance, have made satisfactory progress. These undertakings have been conducted by the division of major surveys, which was created in response to demands for more data on educational problems than the Office of Education has been able to gather in the past.

Research and investigation, which is under the immediate and personal direction of the Assistant Commissioner of Education, functions largely through five divisions: American schools; special problems; foreign-school systems; collegiate and professional education; and statistics. To its staff of consultants the Seventy-first Congress authorized the addition of a specialist well trained in psychology and the theory of education and specialized in the field of tests and measurements.

More than 50 studies were completed and presented for publication by the members of this division during the fiscal year. These publications covered many fields of educational interest and activity and were addressed to school executives, teachers, curriculum workers, supervisors, parents, research workers, college students, as well as to the general reading public. Other manuscripts submitted for publication by individuals outside the office were reviewed and in some cases edited by members of the staff.

The consultant in hygiene and health education completed studies in speech defects in school children, speech defects and their correction, and an individual height-weight card. Progress was also made

in investigations of the physique and carriage of the school child, mind-body relations, and a self-survey for schools.

The specialist in guidance and industrial education completed the following studies: Industrial education in Buffalo; study of school systems for comparative data; list of colleges offering courses in guidance, etc.

The general function of the division of American school systems is to collect and compile information and prepare publications regarding elementary and secondary education in the United States. During the year studies were completed on administration and finance; educational legislation, 1928-30; elementary education; secondary education; kindergarten-elementary grade report cards; and how boys and girls can help in the drought emergency.

In the division of collegiate and professional education the following outstanding investigations were completed: Study of scholarships and fellowships available at institutions of higher learning in the United States; a report to the board of trustees of Howard University and to Congress on "A program of development of Howard University from 1931-32 to 1940-41." Career leaflets offering vocational and educational guidance material on various subjects were published during the year, and proved very popular. These leaflets answer specific questions which high-school graduates and college students ask concerning vocations.

Dr. Frederick J. Kelly has been recently appointed to the chiefship of the division of collegiate and professional education. It is expected that the investigative point of view will play an increasingly important part in all the work of the division.

The division of special problems comprises sections in negro education, education of exceptional children, the education of indigenous peoples, and problems of education in sparsely settled areas. To this division will be added a specialist in the education of the physically handicapped, a position authorized by the last Congress.

Through a subsidy from the Carnegie Corporation and administered by Stanford University, Mr. H. D. Anderson has spent one year in Alaska studying sociological and psychological problems of the Eskimos. He is now at work in Alaska on similar problems concerned with the Aleuts. This work comes under the section having to do with the education of indigenous peoples. The Commissioner of Education, in his report, urges that Congress should authorize the appointment of a full-time specialist in the field to continue work of the foregoing character with continental Indians, the Porto Ricans, the Hawaiians, the Filipinos, and the native population of our other possessions. Mrs. Katherine M. Cook, chief of the division of special problems, familiarized herself during the

fiscal year, by study and personal visits, with this problem in Alaska.

Studies were completed in this division on supervision and rural school improvement, provisions for exceptional children, plans of four States—Minnesota, Missouri, North Dakota, and Idaho—for the development of rural school instruction, etc.

In the division of foreign school systems four circulars were prepared to help college and university registrars to evaluate foreign school credentials. A comprehensive study of the national administration of education, primary and secondary, higher education, and technical and agricultural education in Belgium was made by the chief of the division, based upon his visit to that country. Studies were completed on national ministries of education, secondary education in Norway, and a graphic presentation of statistics on illiteracy by age groups.

To the division of foreign school systems will be added a specialist in the educational movements in Germanic and Scandinavian countries, whose appointment was authorized by the Seventy-first Congress.

The division of statistics completed the following studies: Statistics of public, society, and school libraries, 1929, which cover 10,937 libraries of 1,000 volumes or more; expenditures in publicly controlled universities, colleges, and professional schools, 1927-28; per capita costs in city schools, 1929-30; and statistics of the Negro race, 1927-28.

The Commissioner of Education recommends that in the near future attention should be given to strengthen the statistical division, which, in a sense, is the handmaid of all the other divisions. First, the work now done by four assistant statisticians who are charged with gathering data in the field every other year should be reorganized in such a way that six persons may gather this information in a 4-month period, thereby shortening the time which elapses between the close of a given school year and the issuance of findings; second, there should be a section in the division having personnel and machines adequate to the making of graphs and tables needed for all the publications and survey reports of the office.

The service division completed studies on adult education, home education, commercial education, home-economics education, physical education, school building problems, and radio education. The latter investigation included a study of the activities of educational broadcasting stations; a compilation of data pertaining to the use of radio in the schools, colleges, and universities, and in informal education; a study of the use of radio in education in foreign countries; and a study of experiments, researches, evaluations by educators, programs, and other material on education by radio.

During the past 15 months the Office of Education has had the services of a specialist in education by radio who was loaned by the Payne Fund, of New York City. All arrangements have been made for the selection of a senior specialist in education by radio, a position which will be filled before this report is in print. This specialist will advise educational institutions and individuals who are interested in education by radio and make contact with broadcasters as well as educators.

One of the important functions of the office is the service rendered to educational agencies in need of professional assistance in carrying on their regular work or in solution of their particular problems. In December, 1930, the Office of Education's part of the Buffalo, N. Y., public-school survey was completed. During the spring of 1931 the Board of Education and the Chamber of Commerce of Youngstown, Ohio, invited the office to make a survey of the public schools of that city. Considerable information has already been collected. A survey of home-economics education in the junior and senior high schools of Montclair, N. J., with recommendations for curriculum revision, was made in April, 1931. The survey of the school building situation in Warwick, R. I., was completed, as was a survey of the Park View School, Washington, D. C.

Brookings Institution, of Washington, D. C., invited the Office of Education to make a survey of the publicly conducted schools of Mississippi. Preliminary work already has been done, and it is expected that the report will be ready for printing by November 15, 1931.

Early in 1931 the United States Department of Agriculture asked the Office of Education to cooperate in a social and economic survey of the Southern Appalachian Mountain region, the office to be responsible for that part of the survey relative to education. It is contemplated that about three years will be required for the completion of the survey.

Reports on the surveys of the State-supported institutions in both Oregon and Arkansas were completed by the division of colleges and professional schools published by the office.

The division of special problems and the division of statistics assisted a committee of the Vermont Commission on Country Life to make a survey of rural education in that State. A report of the study has been made to the commission.

The library division during the fiscal year rendered efficient service to the cause of education through its studies of the library in the elementary school and the relation of the county library to the rural school. Its Record of Current Educational Publications now appears quarterly and promptly, and so prepared under the direction of the members of the staff and outside experts as to fill a new place in

American education. The librarian acts as contact agent with the American Library Association.

At the request of the State Department of Public Instruction of Pennsylvania, the chief of the division of American school systems is serving as the associate director of a comprehensive study of the schools of that State undertaken for the purpose of planning a 10-year program. Other members of the staff are acting as consultants in various phases of the study.

The National Advisory Council on School Building Problems has cooperated enthusiastically with the office, the work of the past year centering on the elementary school. This study will be continued during 1932. Next will follow problems involved in junior high school buildings, and 1934 and 1935 will be given to the consideration of buildings for senior high schools and 4-year high schools.

Much assistance has been rendered by the staff of the office to State departments of education and educational associations. One of the specialists has contributed to the work of the George Washington Bicentennial Commission and the Oregon Trail Association.

Regional conferences were held on homemaking, parent education, rural school supervision, school building problems, higher education, radio educational problems, etc.

The service division, through its chief, Mr. Alderman, has been in conference with the Department of Justice regarding adult education in Federal prisons, and has held, in cooperation with the Ohio State Department of Education, a conference at Chillicothe, Ohio, on this subject.

The editorial division has been thoroughly reorganized. School Life, which has become not only the organ of the Office of Education but also a teachers' guide to all publications of the Government that may be useful to schools, has attracted much favorable comment.

The following is a record of the number of publications edited, proofread, and distributed by the editorial division: Bulletins, 44; pamphlets, 8; leaflets, 5; reading courses, 7; catalogues, handbooks, etc., 25. To satisfy the many requests for information on the work of the office a brief, concise handbook of the Duties, History, and Recent Publications of the Office of Education was issued. Publications of the Office of Education were displayed at 14 educational meetings during the fiscal year.

In the work of cooperation and coordination with other educational agencies, etc., the Office of Education made progress during the fiscal year. The national committee on State histories of education is collaborating with the office in the preparation of a new series of State histories of education. At the present time work on manuscripts for the following States is reported under way: California, Connecticut, Georgia, Kansas, Kentucky, Maine, Maryland, Massachusetts, Nebraska, New Jersey, Oklahoma, Oregon, Utah, and Washington.

GEOLOGICAL SURVEY

SUMMARY OF THE ACTING DIRECTOR'S REPORT

Geologic work was done in 38 States, Hawaii, and Alaska, and in this work many State and Government agencies and nongovernmental scientific organizations cooperated.

The special 5-year potash exploration program authorized in 1926 and 1927 (44 Stat. 768, 1388) was completed, four sites for core tests having been recommended to the Bureau of Mines during the year. The total number of sites thus recommended during the five years is 24, all but one in New Mexico and Texas. One company has sunk a shaft and begun commercial production in the New Mexico field. The geologic conditions of the areas investigated have certain resemblances to those of the German potash area. The explorations have disclosed substantial bodies of certain potash minerals that are apparently thick enough, rich enough, and shallow enough to justify mining operations.

Research in geologic science, which has always formed an essential part of the Geological Survey's work but has been relatively overshadowed by the greatly increased demand for work in applied geology, has been expanded by means of a new item for that specific purpose included in the annual appropriation act. Work has thus been begun on a few research problems selected from the much larger number that have long awaited study.

The compilation of a geologic map of the United States was pushed with vigor during the year. Maps of 36 States are now finished, and considerable progress has been made on the others.

Substantial progress has been made on several of the guidebooks for the excursions of the International Geological Congress, which is to meet in Washington in 1933.

Stratigraphic problems connected with the lead and zinc deposits of northern Arkansas were investigated in cooperation with the Arkansas Geological Survey.

Cooperation with the Geological Survey Board and the Metal Mining Board of Colorado in the study of the mining districts of the State was continued, investigations being made in the Front Range, the San Juan region, and the Silverton, Rico, Cripple Creek, Leadville, and other districts.

Investigations of the geology and ore deposits of south-central Idaho, partly in cooperation with the Idaho Bureau of Mines and Geology, were continued.

Additional field work was done under the cooperative program with the Nevada Bureau of Mines in the Tonopah and other districts.

Cooperation with the Oregon State Mining Board was continued throughout the year, and ore deposits in several parts of the State were studied.

A study of the New River zinc district, in Virginia, was begun in cooperation with the Virginia Geological Survey.

A stratigraphic and structural study of the Kettleman Hills oil field, in California, was begun.

The oil and gas possibilities of the Jackson area, Mississippi, were studied.

Coal deposits were examined in Colorado, Montana, New Mexico, and Oklahoma.

Studies in volcanology were made in California, Hawaii, and Alaska.

Investigations of the glacial geology and physiography of Idaho, Montana, and Washington were continued.

Investigations of numerous nonmetallic resources in eastern and central Oregon were carried on.

Geologic mapping was continued in several of the coastal plain States.

Investigation of the physiographic history of the head of the Mississippi embayment was continued.

More than 8,400 rock samples were examined, analyzed, or otherwise tested in the chemical laboratory.

Topographic work was begun in one of the largest unsurveyed tracts still remaining in Alaska, an area north of Bristol Bay which there was reason to believe might contain valuable mineral deposits.

Work was also started in another promising unsurveyed area between the Yukon and Porcupine Rivers.

An extensive project supported by funds appropriated for the Alaska Railroad and transferred to the Geological Survey was begun during the year, examinations being undertaken in eight areas.

The topographic surveys made during the year in the United States added over 18,000 square miles to the mapped area and increased the percentage of this area to 44.6. In this work cooperation was extended by 21 States, 2 counties, and Hawaii. There was a large increase in the number of surveys requested by other departments and bureaus.

Measurements of stream flow were made in 47 States, the District of Columbia, and Hawaii, and the number of gaging stations was increased from 2,426 to 2,663. About 63 investigations relating to ground water or power and reservoir sites were in progress in 19 States and Hawaii. In the work on water resources 40 States and Hawaii cooperated. Federal bureaus and other governmental agencies and permittees and licensees of the Federal Power Commission also cooperated.

The mineral content of 1,667 samples of water was determined by chemical analysis, and studies of the dissolved and suspended matter in the Colorado River were continued.

Besides the routine statistical work on power resources, a report on the developed water power of the United States was prepared.

The classification of public lands and the technical supervision of mineral and power development on such lands and of mineral development on Indian lands were continued in 20 States and Alaska. The results accomplished include net decreases of 197,430 acres in outstanding coal withdrawals, of 15,475 acres in outstanding petroleum withdrawals, of 51,392 acres in power reserves, and of 234,644 acres in enlarged-homestead designations, and net increases of 1,232,728 acres in stock-raising homestead designations and of 8,530 acres in public water reserves.

Among the outstanding publications of the year are Professional Paper 160, on the geologic history of the Yosemite Valley, setting forth the results of years of study by a geologist who is an expert interpreter of land forms; Bulletin 817, a revised edition of the fascinating story of the boundaries of the United States and the several States; Bulletin 823, a cumulated bibliography of North American geology for 1919-1928, supplementing the indispensable bibliography for 1785-1918 contained in Bulletins 746 and 747; and Bulletin 825, a detailed explanation of methods that have proved satisfactory in the microscopic determination of the ore minerals, with tables showing distinctive properties of the minerals and an account of short cuts that may be used in identifying them.

THE BUREAU OF RECLAMATION

SUMMARY OF THE COMMISSIONER'S REPORT

The area irrigated in 1930 with water from Government works was 2,790,856 acres, an increase of 72,726 acres over that of 1929.

The area cropped was 2,805,460 acres, an increase of 100,220 acres.

The total value of crops was \$119,661,820, a decrease of \$41,518,060 compared with 1929, owing to the agricultural depression and the prevailing low prices for practically all crops.*

Since water was first available in 1906 the cumulative value of crops grown on land irrigated from Government works amounted to \$1,761,929,500.

Construction payments in the fiscal year 1931 were \$4,794,833.32, an increase of \$1,563,301.25 compared with the previous year.

Payments for operation and maintenance were \$1,426,138.04, a decrease of \$224,958.72 compared with the previous year.

Total payments amounted to \$6,220,971.36 compared with \$4,882,628.83 in 1930, an increase of \$1,338,342.53.

Income to the bureau from all sources during the fiscal year was \$10,367,666.56, or \$1,332,158.21 more than in the previous year.

The operation expense for the year was \$1,735,784.91, a decrease from the previous year of \$50,413.74.

Excess of operation and maintenance expense over receipts for the period amounted to \$309,646.87, compared with an excess of expense over receipts of \$135,101.89 for the previous year.

The amount available for construction was \$11,860,000.

The amount expended on construction was \$10,843,700 compared with \$8,611,400 the previous year.

The bureau has expended for surveys and investigations, construction, operation, and maintenance, and incidental operations, \$263,400,000, distributed approximately as follows:

Surveys and investigations not allocated to primary projects-----	\$3, 100, 000
Construction of irrigation works, etc-----	215. 800, 000
Operation and maintenance-----	34, 300, 000
Incidental operations, plant, and equipment, etc-----	10, 200, 000
Total-----	263, 400, 000

Accretions to the revolving fund come from the sale of public lands, the receipts from which source last year amounted to \$635,-

290.72, and from royalties from oil leases, which last year added \$2,098,855.96 to the fund.

Of the money that has been made available for Federal reclamation work, more than 37 per cent has come from repayments by the water users and collections from other sources.

In 1931 there were on the projects 40,354 irrigated farms, with a population of 165,956; 213 cities and towns, with a population of 472,723; 688 schools, 724 churches, and 120 banks, with deposits of \$134,261,170; and 226,014 project and nonproject depositors.

The work accomplished on the Boulder Canyon project during the last fiscal year is impressive in its magnitude and because of the speed which has been made in transforming a desert waste into a hive of construction activity.

The project was formally inaugurated with the approval by President Hoover on July 3, 1930, of the first appropriation of \$10,660,000. This was increased on February 14, 1931, by a further appropriation of \$15,000,000.

A temporary headquarters office for the construction engineer and his force was opened in Las Vegas, and will be used until the winter of 1931, when a permanent office will be established in Boulder City.

On March 11, 1931, Secretary Wilbur signed the award of contract to the Six Companies (Inc.), of San Francisco, the low bidder, for the construction of the 730-foot Hoover Dam, the power plant (except installation of machinery), and all appurtenant works, at the bid price of \$48,890,995. The contract price does not include the furnishing of materials which enter into the completed work, such as cement, reinforcing steel, pipe and fittings, conduits, valves, gates and hoists, and structural steel. The total estimated cost of the work covered by the contract, including all materials is about \$76,000,000. The power machinery and its installation will cost an additional \$15,000,000.

A contract was entered into with the Union Pacific system under which a 22.7-mile branch line was constructed by and at the expense of the company from its main line near Las Vegas to Boulder City. The branch line is constructed with 90-pound rails and is ballasted throughout. Ten tracks with a total capacity of 600 cars have been built at the interchange yard at Boulder City.

Under a contract with the Southern Sierras Power Co., of Riverside, Calif., to furnish power for construction purposes, the company constructed a transmission line 235 miles long from Victorville, Calif., to Hoover Dam site and erected a substation at the terminus of the line. The contract provides for the delivery of a maximum of 15,000 kilowatts, at an average price of about $1\frac{3}{4}$ cents per kilowatt-hour. Power was being delivered over this line at the end of the fiscal year.

The General Construction Co., of Seattle, Wash., was awarded a contract for the construction of a 24-foot oil-macadam highway, 7 miles long, from Boulder City to Hoover Dam site, and at the end of the fiscal year the highway had been practically completed.

A contract was awarded to the Lewis Construction Co., of Los Angeles, Calif., for the construction of a railroad, 10 miles long, connecting the end of the Las Vegas-Boulder City line with the dam site. This road will be completed during the summer of 1931 and turned over to the Six Companies (Inc.) for operation. The contractor for the dam is also constructing 20 miles of railroad, one branch running from the Government railroad down Hemenway Wash to the boat landing and thence along the Nevada canyon wall to the outlets of the diversion tunnels, and a second branch, 12 miles long, to the deposit of sand and gravel in Arizona.

The 9-mile pipe line of a water system to provide for 2,500 people was practically completed, and pumps were being installed to lift the water 2,000 feet from the river to Boulder City.

Construction of six 3-room and six 4-room cottages for Government employees was well under way.

Bids were opened on June 30 for work at Boulder City to include street, alley, parking area, and sidewalk grading; street paving; street and parking area surfacing; curbs and gutters; sidewalks; sanitary sewers; and water-distribution system.

Plans were completed and bids were to be opened in July for the construction of an administrative building, dormitory, and guest house, post-office building, and about 60 residences.

The Six Companies (Inc.) had erected office buildings, mess houses, dormitories, and 4-room houses for married employees, and were actively engaged on the 2-year work of excavating the four tunnels, each 50 feet in diameter and with a total length of 3.1 miles, through which the Colorado River will be diverted during the period of construction of the dam. They were also engaged in preparing designs of the gravel screening and concrete-mixing plants, the installation of equipment and machinery, the layout of cableways, and numerous other matters to be determined in a contract of this size.

In order to accomplish this transformation plans and specifications had to be prepared at unprecedented speed, requiring the closest coordination of the Washington and Denver offices to avoid any delay in their preparation, printing, and distribution to prospective bidders. That the work was done in a minimum of time is a tribute to the reclamation organization.

Probably no embryo town has ever received the widespread publicity that has resulted from the announcement that the Govern-

ment planned to construct Boulder City in connection with the building of Hoover Dam.

A city planner and landscape architect was employed to lay out the town according to the latest approved standards. Three main arterial highways are the basis of the street plans, the center one being the axis of the town and all three centering on the Government administration building. At right angles to these boulevards is the main business street, with all other streets connecting the boulevards parallel to the main street. Residential streets parallel the three boulevards.

Parking space is provided by open plazas in the downtown business blocks, no parking being allowed on the streets. In the residential areas open plazas have been provided for small parks and playgrounds.

Thousands of letters of inquiry were received from all parts of the United States asking about business and residential opportunities in the new town. In order to supervise and control the various industrial activities permits will be issued to engage in specified lines of business, and lots in the town will be leased for this purpose.

On June 30, 1931, it was reported that 295 formal applications had been filed for business permits in Boulder City, representing 36 States and 62 kinds of business.

Two important dams have been completed during the year—the Echo Dam on the Salt Lake Basin project, Utah, and the Deadwood Dam on the Boise project, Idaho.

Plans and specifications were also prepared for construction of the Cle Elum Dam on the storage division of the Yakima project, Washington, and the Thief Valley Dam on the Baker project, Oregon, both of these structures to be advertised for bids early in the ensuing fiscal year.

The 405-foot Owyhee storage dam on the Owyhee projects, Oregon, was under construction and excellent progress was made, so that the dam was 72 per cent completed at the end of the fiscal year.

Canals, laterals, and structures to distribute water from the Easton diversion dam to 72,000 acres on the Kittitas division of the Yakima project, Washington, were practically completed. Canal construction was continued on the Gooding division of the Minidoka project, Idaho; the Vale project, Oregon; the Sun River project, Montana; the Klamath project, Oregon-California; and tunnel construction on the Owyhee project, Oregon.

Drainage ditches were constructed on the Belle Fourche project, South Dakota; the Lower Yellowstone project, Montana-North Dakota; the Shoshone project, Wyoming; the Rio Grande project, New Mexico-Texas; and the Klamath project, Oregon-California.

During the fiscal year 476 miles of canals, ditches, and drains were completed, making a total length to date of 17,467 miles. At the end of the fiscal year tunnels numbered 132, with a total length of 40 miles. Canal structures numbered 165,427, of which 3,958 were built during the year; bridges, 12,194, with a total length of 56 miles; culverts, 15,787; and flumes, 5,540. The bureau laid 4,436,952 feet, or 840 miles, of pipe. There were 1,461 miles of road constructed, 117 miles of railroad, 4,011 miles of telephone lines, and 3,226 miles of transmission lines. The various construction activities have involved the excavation of 303,797,172 cubic yards of earth and rock. In building dams and other irrigation structures there have been placed 4,776,359 cubic yards of concrete, involving the use of 5,350,393 barrels of cement. Riprap totaled 2,570,254 cubic yards; paving, 1,974,756 square yards; and granite, 912,096 square yards.

During the winter of 1930-31 Federal reclamation faced a crisis. Construction under the large contracts on the Owyhee, Vale, and Kittitas projects was being carried on at an almost unprecedented rate owing to the open winter and unusually favorable weather conditions. Repayments from water users had fallen off as a result of the negotiation of adjustment contracts extending the period of payment on several projects. Money needed to pay workers and complete important contracts was rapidly being exhausted and a point was being reached where it would be necessary to shut down construction and discharge from 1,000 to 1,500 employees. This was to be avoided if at all possible.

A presentation of the situation was made to the committees of Congress with the request that a moratorium be granted on the repayment to the General Treasury of \$1,000,000 a year on the bond loan of \$20,000,000, on which \$11,000,000 had been repaid. A further request was also made for a loan from the Treasury of \$5,000,000 to meet contract obligations and complete construction urgently needed to make it possible to deliver water to land struggling with an inadequate supply.

As a result laws were enacted authorizing a moratorium of two years on the repayment of the bond loan and also authorizing the loan of \$5,000,000. Beginning July 1, 1932, payments will have to be resumed on the \$20,000,000 loan at the rate of \$1,000,000 a year, and on July 1, 1933, repayment of the \$5,000,000 loan will commence, also at the rate of \$1,000,000 a year, necessitating yearly payments from the construction income of the bureau of \$2,000,000 for the ensuing five years. These payments will result in a material reduction in the yearly construction revenue of the bureau, which will all be absorbed for the next 15 years in completing works now authorized.

It is important for the future welfare of the public-land States that it be more generally appreciated that the reclamation fund, established for the development of those States, can accomplish this great work only as it has money available to carry on construction of needed feasible projects. If payments due the fund from existing projects are deferred or if income from power, logically belonging to the fund, is diverted to the benefit of individuals on projects favorably situated for power development, the general progress of development is to that extent handicapped.

Two hundred and one irrigable farm units were opened to entry during the fiscal year, as follows:

October 18, 1930, Tule Lake division, Klamath project, Oregon-California, 24.

February 9, 1931, Bully Creek west bench, Vale project, Oregon, 5.

May 1, 1931, Pilot division, Riverton project, Wyoming, 50.

June 1, 1931, part 4, Willwood division, Shoshone project, Wyoming, 35.

June 10, 1931, Greenfields division, Sun River project, Montana, 87.

These units were offered first to ex-service men, who, under the law, have a 90-day preference right of entry, subject, however, to the usual required qualification of at least two years' farming experience and available capital of at least \$2,000.

The units on the Tule Lake division of the Klamath project were filed on immediately by ex-service men who were exceptionally well qualified, more than 160 men with capital ranging from \$2,000 to \$10,000 and above making application for the 24 available units. The eagerness to acquire these lands may be accounted for by the fact that they are located in the midst of a settled and developed community, are practically level, and require virtually no clearing.

The units on the other projects were being filed on somewhat more slowly but with every indication that within a relatively short period after the expiration of the 90-day preference right of ex-service men they would be all taken up.

Even on the Riverton project, whose development has been unduly delayed because of lack of adequate transportation facilities and a beet-sugar factory, hundreds of inquiries concerning the lands which lie close to the town of Riverton had been received and a number of prospective settlers had visited the project with a view to filing.

There is no question about the disposal of the lands on the Willwood division of the Shoshone project, where the number of settlers during the year increased from 45 to 64, and on the Greenfields division of the Sun River project, as there has been a steady influx of settlers to the former during the past four years and a marked local interest in the latter opening, where at the close of the fiscal year 34

applications from qualified applicants had been received and 30 farm units had been filed on.

Indications point to a definite trend from the city to the farm, and, with this, increased interest in the opportunities offered to country-minded men and women of small means on the Federal irrigation projects.

In its work of settlement and development the bureau has received the whole-hearted support of the railroads traversing the projects, of local settlement organizations, and of many State agencies.

Under the policy of decentralization and local control 17 projects or divisions of projects have been turned over to the water users' organizations for operation and maintenance, as shown in the following table:

Project	Year	Remarks
Salt River project, Arizona.....	1917	Association operating entire project.
Boise project, Idaho.....	1926	United States operating reserved works; board of control operating transferred works.
King Hill project, Idaho.....	1926	District operating entire project.
Minidoka project, Idaho:		
Gravity division.....	1917	United States operating reserved works.
South side pumping division.....	1926	Do.
Huntley project, Montana.....	1928	District operating entire project.
Sun River project, Montana:		
Fort Shaw division.....	1927	Do.
Greenfields division.....	1931	
North Platte project, Nebraska-Wyoming:		
Interstate division.....	1926	United States operating reserved works.
Northport division.....	1927	Do.
Fort Laramie division.....	1927	Do.
Newlands project, Nevada.....	1927	District operating entire project.
Umatilla project, Oregon.....	1926	District operating entire project, except McKay Reservoir.
Strawberry Valley project, Utah.....	1927	Association operating entire project.
Okanogan project, Washington.....	1929	District operating entire project.
Shoshone project, Wyoming:		
Garland division.....	1927	United States operating reserved works.
Frannie division.....	1930	Do.

The projects shown in the following table will be turned over to the water users for operation at an early date:

Project	Year	Remarks
Grand Valley project, Colorado.....	1937	Contract executed.
Uncompahgre project, Colorado.....	1932	Do.
Milk River project, Montana.....	1936	Certain works to be reserved.
Lower Yellowstone project, Montana.....	1932	Contracts executed. Entire project will be transferred.
Vale project, Oregon.....		Project will be transferred upon completion of construction.
Owyhee project, Oregon-Idaho.....		Do.
Belle Fourche project, South Dakota.....	1934	Contract executed. Entire project will be transferred.
Salt Lake Basin project, Utah, first division.	1932	Contract executed.
Yakima project, Washington, Kittitas division.	1932	Do.

Each year of operation by the water users' organizations strengthens the belief in the wisdom of this policy. Under it the water users are gaining experience in many problems of operation and maintenance with which they are confronted and are becoming more and more self-reliant.

THE NATIONAL PARK SERVICE

SUMMARY OF THE DIRECTOR'S REPORT

Travel to the national parks and monuments during the past year broke all records, with a combined total of 3,544,856 visitors. This is 9.18 per cent over the 1930 total of 3,246,656. There was a large increase in motor travel. Rail travel, however, showed a still further decrease over 1930. Under these conditions the public automobile camps and housekeeping accommodations received heavy patronage.

National park standards.

The high standards governing national-park establishment and protection were strengthened during the year, both through special action of Congress and through administrative action of the National Park Service.

The Sullys Hill Park, an area in no way measuring up to national-park standards, was removed from the system and made a game preserve, and many special authorizations for various parks regarding utilization not in accordance with national-park policies were repealed.

The National Park Service strengthened its protective policies with regard to predatory animals, setting forth its rules against extermination of any species of wild life and the use of poison, as well as restrictions in the use of steel traps. It also stressed its policies against any introduction of exotic species of flora and fauna in the national parks and monuments, and outlined plans for the establishment of additional "wilderness areas" within the parks.

National Park Service now entirely under civil service.

On August 10, 1931, the President covered the national park superintendents and monument custodians into the civil service. This makes the National Park Service, whose Washington office always has been under civil service, as completely under the civil service regulations as any similar bureau in the Federal Government.

Changes in park and monument system.

Through changes in park and monument boundaries and the establishment of two new national monuments the total area of the park and monument system was increased from 10,339,506.55 acres to 12,113,621.30 acres.

The Colonial National Monument, in Virginia, was established by presidential proclamation on December 30, 1930, in accordance with enabling legislation of the previous July. Its boundaries as outlined include Jamestown Island, the old town of Williamsburg, portions of the Yorktown Battlefield, and a connecting parkway. Upon establishment of the monument the National Park Service devoted its efforts to obtaining lands in Yorktown and making such developments as were needed in connection with the sesquicentennial celebration at Yorktown, October 16 to 19, 1931, of the culminating battle of the American war for independence. A total of 1,960.76 acres of land in the monument area was secured, practically all of it in the Yorktown Battlefield area. The National Park Service cooperated with the United States Yorktown Sesquicentennial Commission by handling all of the construction work at Yorktown and taking over the details of purchasing, disbursing, and accounting for funds, and certain details of printing.

The Canyon de Chelly National Monument in Arizona, an area of 83,840 acres, was established by presidential proclamation dated April 1, 1931. It contains cliff-dweller ruins of great importance, and also is remarkable from a scenic standpoint.

The eastern boundary of Mount Rainier National Park was extended to take in an area of 34,000 acres, including spectacular mountain scenery and affording a natural boundary line between the park and the adjoining national forest.

The area of Bryce Canyon National Park was increased to 35,240.08 acres under congressional legislation, which added 22,068.52 acres of scenic country to the park and restored 1,266.72 acres of park land to national-forest status.

Acadia National Park acquired 1,379.30 acres during the year, bringing its total area up to 11,500 acres, all the gift of private citizens.

The boundaries of Wind Cave National Park were extended to include several springs and a right of way for a water main, to insure the development of an adequate water system for the park.

The areas of certain monuments also were increased through presidential proclamations, 11,010 acres being added to the Petrified Forest, 8.68 acres to the Aztec Ruins, 1,926.35 acres to the Pinnacles, and 1,609,600 acres to the Katmai.

Pending boundary problems.

Several important boundary adjustments should be accomplished in order to insure proper development and to preserve important areas. It is urgent that these be consummated in the near future if several areas of national-park caliber are to become a part of the system.

These include the acceptance, for addition to Grand Teton National Park, of important lands now held in trust for this purpose by the Snake River Land Co., organized by John D. Rockefeller, jr., extensions to both the north and south rims of the Grand Canyon for the better protection of fauna and flora; the giving of park status to the Kings River area, to which General Grant Park would be added as an isolated section; the enlarging of the surface area of Carlsbad Caverns National Park; and securing the additional lands needed to give full park status to the Great Smoky Mountains project. In connection with the latter project, the States of North Carolina and Tennessee plan soon to present to the United States deeds to an additional 138,843.20 acres in the park area.

Eastern park projects.

Several park projects under way in the eastern portion of the United States in addition to the Great Smoky Mountains promise a comprehensive eastern system in the not distant future. The Mammoth Cave National Park Association, engaged in securing lands for the park project, reports that it now has available sufficient funds to complete the project and that already 20,000 acres of land, including Mammoth Cave itself, have been secured. In the Shenandoah region the State of Virginia is engaged in mapping and valuing the lands planned for inclusion in that park.

Just at the close of its last session, Congress authorized the establishment of the Isle Royale National Park in Michigan, upon the same conditions as those governing the other eastern projects—that the necessary lands therefor must be donated to the United States in fee simple for park purposes. During the summer the Governor of Michigan appointed a particularly strong commission to undertake the acquisition of the Isle Royale lands.

A favorable report on the Everglades park project, in southern Florida, was submitted by this department to Congress early in the last session. A bill to establish the park thereupon was introduced and passed the Senate, but failed of passage in the House before the termination of the last session. It is understood that similar legislation will be introduced in the first session of the Seventy-second Congress, and it is hoped the project will receive favorable action at that time.

Investigations of proposed additions to park and monument system.

Each year requests for the establishment of a large number of national parks and national monuments are received by the Director of the National Park Service. While undoubtedly the majority of these will not meet the high requirements of the system, they, nevertheless, are listed for careful investigation as a matter of fairness to

their proponents. Last year 18 such projects were investigated, leaving a total of 55 national-park projects and 44 monument projects awaiting investigation.

Acquisition of alienated lands continued.

The existence of private holdings within national park boundaries is a serious menace to proper administration and protection. The National Park Service is still required to match dollar for dollar the greater part of the \$1,000,000 Federal appropriation for land acquisitions with contributions secured from outside sources. Two hundred thousand of this fund, made available for 100 per cent land purchases at present, must be matched later on. Purchases during the year were limited to Yosemite, General Grant, Zion, Rocky Mountain, and Glacier National Parks. In addition, a special fund of \$500,000 for the acquisition of the Yorktown Battlefield, in the Colonial National Monument, was appropriated early in the current year. The total land acquired during the year by purchase and donation was 21,078.37 acres, of which 1,960.52 acres are in and around Yorktown.

Research and education.

The new branch of research and education, established in the National Park Service just before the opening of the past year, was engaged primarily in coordinating and expanding the educational service and programs in the parks, particularly the lectures and field trips. Much time also was devoted to field personnel matters, including the furnishing of assistance to the Civil Service Commission in oral examinations.

The outstanding new work inaugurated along educational lines was the appointment of a chief historian to supervise the service's activities dealing with history and archæology. The principal historical achievement of the year was the cooperation on historical matters furnished the United States Yorktown Sesquicentennial Commission at the Colonial National Monument, where two local assistant historians were appointed to carry forward plans for interpreting colonial history to its many visitors. This work also will be extended to the George Washington Birthplace National Monument at Wakefield, Va., and later to the historic and prehistoric monuments of the Southwest.

An important step in organizing the field naturalist work was the appointment of an experienced park naturalist to cover the southwestern monuments.

With regret the resignation of Dr. John C. Merriam, chairman of the educational advisory board, was accepted, since the increased work of his other activities made this action necessary. Dr. H. C.

Bumpus, of the American Association of Museums, who has been in close touch with national-park activities for many years, especially its museum work, was appointed to the chairmanship. Waldo G. Leland, a historian of high standing, was appointed to fill the vacancy on the board caused by the resignation of Doctor Merriam.

The memory of the late Representative Nicholas J. Sinnott, of Oregon, who, as chairman of the House Committee on Public Lands, proved himself a true friend of the national parks, was honored in Crater Lake National Park through the erection of the Sinnott Memorial. This attractive stone building, erected on the rim of the lake with funds appropriated by Congress, was dedicated to public use on July 16, 1931, by members of the House Public Lands and Appropriations Committees. A gift of \$5,000 from the Carnegie Institution of Washington made possible the installation of instruments and exhibits which will help visitors to interpret the geologic story of the lake.

Museum development at Yellowstone National Park, sponsored by the Rockefeller Foundation and the American Association of Museums, made excellent progress. The Fishing Bridge Museum and the Trailside Shrine at Obsidian Cliff were opened to visitors during the summer.

In other parks museums were expanded as funds permitted, as was the case in several national monuments. Of unique interest is the plan now being developed to emboss an actual fossilized skeleton of a dinosaur in situ within the Dinosaur National Monument. Under a cooperative arrangement the American Museum of Natural History will excavate the skeleton, and the National Park Service will handle construction details.

The increased use of the national parks as field classes by educational institutions, with emphasis on ecological studies, has been noted with keen interest. The naturalist forces cooperate to the fullest extent with such visiting classes, and the museums afford a wealth of valuable study material.

Animal conditions and studies.

Excellent reports of animal conditions have been received from the various national parks. Contrary to expectations, a mild winter followed the severe heat of the previous summer. As a result the animals wintered well and in most cases were not forced to seek forage outside park boundaries. Had the winter been an extremely trying one, it is feared this report would tell a very different tale, since drought conditions would have had to be combated.

The 3-year studies of wild life conditions were continued. Joseph Dixon, field naturalist, and George Wright and Ben Thompson, park naturalist aids, continued to work partly under funds pro-

vided by Mr. Wright for this purpose and partly under new Federal appropriations. The purpose of the study is to gather data on the major animal problems of each park, to solve problems needing immediate attention, and to help in formulating general wild-life policies. Special studies were made of damage by deer, bears, and porcupines, and of the means to protect the fast-disappearing trumpeter swan.

The cooperative elk survey in the Yellowstone country, supported by the Biological Survey, Forest Service, Montana Fish and Game Commission, and the National Park Service, was continued. William Rush, in charge of the investigation, has worked out migration routes, life history, and forage requirements of the Yellowstone elk. Dr. O. J. Murie of the Bureau of Biological Survey, continued elk studies in the Jackson Hole.

Forest protection.

It was necessary, because of the cumulative effects of two successive seasons of extreme drought, to take extraordinary precautions to protect park forests during the past summer. Naturally, under such conditions, fire was the chief menace. Not only were the forests in an almost tinder-like condition, but conflagrations raged in the general vicinity of the national parks, threatening time and again to cross the borders. Park forces cooperated with national forest and State authorities in fighting such fires, in most cases successfully stopping them before park boundaries were reached.

With this situation prevailing it was only due to the heroic efforts of the park forces, supported by the newer equipment recently made available through larger appropriations, that the parks were saved from exceedingly heavy fire damage.

The worst situation of the year was in Yellowstone National Park, where approximately 18,000 acres in the Heart Lake region were burned by a fire caused by lightning. As this area is some distance from the main roads and trails, it was necessary to pack equipment in, and the fire fighting was a fearfully grueling task. At one time 700 men were on this fire. In fighting this fire the Forest Service rendered notable cooperation.

One especially interesting piece of fire-suppression cooperation was the sending of men from Glacier National Park to assist in fighting a fire in Canada's Waterton Lakes National Park, which adjoins Glacier on the north.

The exceedingly dry conditions also aggravated insect infestation conditions, since the heat was favorable for the multiplication of various insects, particularly the bark beetle. Fortunately the increase in the appropriation for insect and tree-disease control made possible

some very essential work in a number of the major parks, under the supervision of the Bureau of Entomology and the office of blister-rust control.

Road and trail development.

Excellent progress was made in bringing the highway systems within the national parks, and in some of the national monuments, to a standard commensurate with the importance of these areas as focal points of concentrated travel and with conditions on the main approach roads. The Bureau of Public Roads of the Department of Agriculture continued to cooperate with the National Park Service in major road construction in those reservations on the mainland proper in the States, and the Alaska Road Commission continued highway construction in Mount McKinley under the cooperative arrangement in force for several years.

Several major road projects were completed, while others are being pushed to completion as rapidly as possible. Outstanding among these are the Wawona Road and Tunnel in Yosemite National Park, the Generals Highway between Sequoia and General Grant National Parks, the Trail Ridge Road in Rocky Mountain National Park, the Transmountain or Going-to-the-Sun Highway in Glacier National Park, the Rim Drive in Crater Lake Park, the Colonial Parkway between Williamsburg and Yorktown in the Colonial National Monument, and the Summit Drive along the crest of the Blue Ridge in the proposed Shenandoah Park.

Under the authority of the Leavitt Approach Road Act of January 31, 1931, the Red Lodge-Cooke City and the Moran-South Boundary approaches to Yellowstone, the connecting road between Sequoia and General Grant National Parks, and the Desert View-Cameron approach to the Grand Canyon have been started.

In the road building, as well as in all other construction work, every effort was made to give employment to local people. Work under the regular appropriation, as well as under the emergency public works funds, was begun as early in the season as possible and pushed to the limit, so that the maximum number of people might be employed.

An interesting highway development was the designation of the Eastern National Park-to-Park Highway, to connect the Great Smoky Mountains National Park, the Shenandoah and Mammoth Cave projects, and the Colonial and George Washington Birthplace National Monuments. This highway was outlined in the office of Maurice Thatcher, of Kentucky, at a meeting of official representatives of the various States involved last April. It is hoped that later the highway may be extended to take in the existing Acadia National Park in Maine and the new eastern park projects.

Preserving the landscape.

Experts of the National Park Service devote their attention to the park landscape, to save it from irretrievable injury through scarring during construction work, improper location of physical improvements, and the introduction of inharmonious structures.

The advantages of landscape supervision in the locating and construction of highways is now apparent to all. Roads, both in alignment and section, harmonize as nearly as possible with the topography, and all natural features of special interest along the roadsides are protected. In this phase of road building the engineers of the Bureau of Public Roads are taking as keen an interest as the park landscape men, with the result that the roads now being built are undoubtedly the most beautiful and spectacular in the world.

Attention was also given during the year to the plans and location of a variety of buildings, bridges, gateways, and other structures, and the standard of buildings, particularly residences, was raised to a better average than ever before.

Six-year landscape development plans are now in course of preparation for each park, for it is necessary in the landscape work to look farther into the future than in planning for any other branch of park work. These plans, in addition to the major purpose of supplying a definite and orderly basis on which to proceed, will also do much toward the stabilization of employment in the parks.

Appropriations and revenues.

Appropriations for the 1931 fiscal year were \$12,113,435, including \$2,078,800 allocated to the National Park Service for emergency employment funds. For the 1932 fiscal year, under which the service is now operating, the appropriations total \$12,754,250. Cash donations for park and monument development purposes during 1931 amounted to \$65,157.12. The revenues for 1931 were \$940,364.79 as against \$1,015,740.56 for 1930.

In addition to the 1932 appropriation of \$7,500,00 for road work, included in the total appropriations recorded above, authorization was granted to incur contractual obligations for road construction up to an additional sum of \$2,850,000.

Legislation.

During the last session of the Seventy-first Congress 22 measures involving park and monument activities were enacted, while during all three sessions of that Congress 47 acts affecting the Park Service were passed. Among the measures passed last winter were those authorizing the Isle Royale National Park in Michigan; providing for the removal of Sullys Hill Park from the system and its transfer as a game preserve to the Biological Survey; creating Canyon de

Chelly National Monument in Arizona; broadening the authority for the Colonial National Monument in Virginia; enlarging the Mount Rainier National Park by 34,000 acres and moving its east line to the Cascade summit; directing the establishment of a memorial in the District of Columbia to former Director Stephen T. Mather; and withdrawing authority for various privileges in certain parks such as mining in Grand Canyon and Mesa Verde and summer homes in Glacier and Lassen Volcanic National Parks. The Leavitt bill increasing roads and trails appropriations to \$7,500,000 per year was approved on January 31, 1931. It also authorized approach road construction under certain conditions. The important Everglades National Park bill passed the Senate but on its merits did not get consideration in the House.

Public-utility service.

In December the operators of the public utilities in the national parks assembled in Washington for their first conference under the permanent organization effected in accordance with the expressed wishes of department officials. The chief purpose of this meeting was to obtain clarification of the department's policy for the administration of the parks and the public utilities, the relations of the operators with the Government and with each other, and definitions of the rights of operators under their franchises.

A fine piece of utility cooperation was the adjustment, through mutual concessions, of certain overlapping of privileges among the operators in Yellowstone National Park.

Unfortunately the 5-year programs of improvements and betterments submitted by the operators in 1930 again were abated because of lessened business. Although the park hotel rates are extremely reasonable, the hotels were poorly patronized. Representing huge investments, as the hotels do, this lack of patronage entailed heavy losses to their owners. Prospective hotel patrons, generally speaking, went to the lodges and permanent camps for accommodations, while travelers who normally would have gone to the lodges went to the shelter camps or housekeeping establishments, cooking their own meals or using the cafeteria.

Nevertheless, despite early signs of greatly decreased gross revenues, several operators with courage and public spirit pushed to completion developments already undertaken, notably the Sunrise Ridge lodge and housekeeping camp plant in Mount Rainier Park and the new wing of the Canyon Hotel in the Yellowstone, as well as great new stores in that park.

Airplane service was available in Grand Canyon and Mount McKinley National Parks. In these parks, and perhaps in several others, the views from the air are so extraordinary as to make most

desirable the establishment of adequate airplane service to the traveling public. From time to time in the future air service will be extended to some of the other parks. Nevertheless, at this time I see little if any necessity of authorizing airplane service in the majority of parks.

Recommendations of the director.

In closing his annual report the Director of the National Park Service makes three main recommendations, as follows:

1. That the boundaries of certain national parks and monuments be revised to include territory naturally belonging to them and essential to their protection and development.

2. That national-park status be given to several potential park areas before such areas suffer from inevitable commercial exploitation.

3. That the military parks and monuments be transferred to the national park and monument system now administered by the National Park Service, as recommended by several Secretaries of War.

In making his first two recommendations, the director stresses the fact that needed boundary adjustments and the establishment of the few new national parks recommended at the present time will cost the Government little if any additional expense, and adds that delay will impair land values for park purposes and make acquisitions more difficult.

THE TERRITORIES

THE TERRITORY OF ALASKA

SUMMARY OF THE GOVERNOR'S REPORT

The Governor of Alaska, Hon. George A. Parks, in his report for the fiscal year ended June 30, 1931, states that, while the current world-wide economic depression has not excepted Alaska from its operation, the net decrease in trade of the Territory is due to the fall in the price of commodities rather than decrease in their production. Thus the quantity of fisheries products compares favorably with the production of other years, but the value is far below normal. In volume a reduction in salmon only is shown, and this is believed to be but temporary. There is a favorable balance of trade for the fiscal year of \$30,980,670, which is about \$6,000,000 less than that of the year preceding. The report shows the numerous institutions of the Territory in a healthy state and, as a rule, making substantial progress. All are believed to minister to the present or future progress of the Territory, and many will ultimately yield a direct financial profit, as has been the case following the introduction of reindeer, the protection of fisheries, and the facilitation of travel and communication.

Territorial finances.

The report of the Territorial treasurer shows a balance of \$694,-894.93 on June 30, 1931. The combined resources of the Territorial and national banks on the same date were: Capital, \$915,000; surplus and net undivided profits, \$826,800; deposits, \$11,275,000, as compared with: Capital, \$915,000; surplus and net undivided profits, \$935,300; deposits, \$12,252,300, for the previous year. The total assessed valuation of incorporated towns for 1931 was \$26,745,956 as compared with \$25,512,663 for 1930.

Commerce.

The report from the collector of customs shows that the value of the imports and exports declined \$12,171,081. The decrease in value of exports is accounted for in the lower values of copper, salmon, silver, and fur. The total value of exports is \$56,818,375 and of the imports \$25,837,703 as compared with \$68,999,456 and \$32,084,734, respectively, for last year.

Population.

The population of Alaska, as shown by the census of 1930, is 59,278, an increase of 4,242 over the census of 1920, or 7.7 per cent. The largest towns, according to the 1930 census, are Juneau, population 4,043; Ketchikan, 3,796; Anchorage, 2,277; and Fairbanks, 2,101.

Mining.

According to statistics prepared by the United States Geological Survey, Alaska since 1880 has produced minerals, chiefly gold and copper, valued at \$629,313,000. The peak in the production was reached in 1916, when it was reported to be \$48,386,508. Since that time there has been a gradual decline, reaching a low point last year, when the value of all minerals amounted to \$13,812,000. The significant feature, however, is the increase in the gold production. Early reports from the mining districts are reassuring and indicate that there will be a material increase in the gold output for next year. The total gold output from all sources is estimated to be \$8,476,000 as compared to \$7,761,000 in 1929, and of this amount \$4,837,000, or 57 per cent, was derived from placers; \$3,639,000 in gold was derived from lode mines.

Present conditions are more favorable for mining low-grade ore deposits with a small gold content than for many years. The larger mining companies are spending considerable sums in the investigation of promising prospects. The outlook for an increased production is most encouraging, and unless conditions change it is almost certain that many gold prospects that have been abandoned for years will be placed on a production basis in the near future.

The mines in the Territory produced 120,100 tons of coal, valued at \$631,000. The output is about 20 per cent greater than that of last year, and with the exception of the 1928 production it is the largest since commercial coal mining began in Alaska. The mines are capable of producing more coal than is necessary to meet local demands, but last year 61,000 tons were imported from Washington and British Columbia. This was due to inadequate transportation facilities.

Mining is one of Alaska's basic industries, and the gradual decline in the quantity and value of the mineral products has been viewed with apprehension. For the past four years the Territory, in co-operation with the Federal Government, has endeavored to stimulate an interest in the industry. The Federal Government, through the United States Geological Survey, has surveyed and mapped large areas believed to contain valuable mineral deposits. The Alaska Road Commission, War Department, and the Bureau of Public Roads, Department of Agriculture, have assisted in building trails and roads to the more promising districts.

Fisheries.

The output of the fisheries of Alaska as a whole in 1930 compared favorably with the yearly average for the past 10 years, but there was an unlooked-for fluctuation in several districts. The value of the product was far below normal. A decline in the output in the western and central districts was more than balanced by an increase of 82 per cent in the southeastern section. This enormous increase is most significant because it indicates that the rigid regulations, which were promulgated and strictly enforced by the Bureau of Fisheries have achieved the desired results in restocking the streams in this area with salmon.

The total value of the output of the Alaska fisheries in 1930, exclusive of aquatic furs, was \$37,679,049 as compared with \$50,795,819 for the previous year. These figures represent the value of the manufactured product. It is estimated that the value to the fishermen was approximately \$12,285,000 or about \$4,200,000 less than 1929.

Twenty-seven thousand five hundred and sixty-eight persons were employed in the commercial fisheries of the Territory in 1930 as compared with 29,283 in 1929. Of the total in 1930, 15,451 were whites, 4,962 natives, and the remainder of miscellaneous races.

The waters adjacent to the coast of Alaska yield a variety of edible fish, and each year there is an increased production of trout, sable fish, smelt, flounders, lingcod, and rockfish. This is significant because it indicates the possibility of developing these industries.

Seal herds.

The rehabilitation of the seal herds is an outstanding achievement and demonstrates the results which may be derived from intelligent conservation. When in 1910 the United States Government assumed control, unregulated hunting had reduced the herd to approximately 132,000. Twenty years later, under United States control, there are 1,045,101, and yet thousands of pelts have been taken each year and sold in the markets of the world. During the year 1930, 42,500 sealskins were taken from the islands; 41,516 were sold at public auction, and these brought \$821,767. The proceeds from sales are, according to treaty, divided between the United States, Great Britain, and Japan.

Furs.

The value of land fur-bearing animals and furs, exclusive of seals, shipped from Alaska in 1930 was \$2,141,289.74 as compared with \$4,513,863.76 in 1929. This sharp decline is accounted for by the low prices received.

The decline in the price of fur and the small catch in many districts are material factors in the welfare of the natives. In many districts the natives are dependent on fur as a source of revenue, and when they are deprived of this revenue, either by closed seasons or a shortage of fur, they are without means of gaining a living. During the past season there was a shortage of fur in some districts. This condition seems to have prevailed in northern Canada as well; consequently many of the native communities are confronted with a difficult situation. The only fur bearers that can be taken in the areas most affected are beaver; hence a continuation of the open season seems necessary if destitution among the natives is to be avoided. The present regulations require each trapper to present his furs to an authorized officer for authentication before they can be sold. This seems to be the only feasible method of control and would be entirely satisfactory if the game commission could provide such personnel that the trapper could dispose of his catch as he returns from the trapping district. With the limited number of wardens there are many delays and much dissatisfaction. The game commission should be provided with additional funds, which will enable it to employ sufficient personnel to meet demands; otherwise the present regulation which requires sealing all skins must be modified or abandoned.

Reindeer.

Reindeer were introduced into Alaska about 40 years ago as a relief measure to provide food and clothing for the native people. The original herds contained less than 1,500 deer. From this small number the entire western part of Alaska has been supplied, and it is estimated that there are several hundred thousand animals in the herds that are distributed from Point Barrow to Atka Island and in the Yukon Valley. There are a few places where the natives are not supplied with deer, but the Government owns between ten and twelve thousand animals, and these will be used to supply new herds as rapidly as possible.

For many years the surplus deer were utilized by the natives for food and clothing, but the increase has been so great that the demands for these purposes consume only a small fraction of each year's surplus; consequently the industry can supply large quantities for commercial purposes. Prior to last year the Office of Education combined the administration of the reindeer with educational and medical care of the natives. The teachers supervised the management of the herds in addition to their other duties and under the circumstances achieved excellent results until the herds became so large that they could no longer devote the time required to the

work, and it became necessary to create a separate organization for this purpose.

In November, 1930, the administration of the reindeer service was transferred from the Office of Education to the governor's office.

Approximately 13,000 natives are largely dependent on the reindeer industry; of this number 2,500 own deer. Fifty-nine herds, varying in size from a few hundred to 30,000, are owned by natives, and 19 herds are owned by others than natives. Under the plan that has been prepared by the reindeer council the territory that is occupied by the herds has been divided into administrative units of a size that can be properly supervised by a field manager. These units will be in charge of a competent officer skilled in animal husbandry and administration. He will be in control of the herds in his unit under the direction of the general reindeer supervisor, who is a member of the reindeer council.

Timber—National forests.

Alaska contains two national forests, the Chugach and the Tongass. Both are on the southern coast. The Chugach National Forest contains approximately 4,800,000 acres, in which, it is estimated, there are over 6,000,000,000 feet, board measure, of timber. The Tongass National Forest has an area of 16,547,000 acres and contains over 78,000,000,000 feet, board measure, of timber. The Federal Forest Service estimates that the forests of Alaska can maintain an annual production of 1,000,000,000 board feet in perpetuity. The present yearly production varies between 40,000,000 and 50,000,000 feet, or less than one-twentieth of the possible output. Small quantities are exported, but the principal demand is from local markets for saw timber, piling, and ties. Since it appears that the market output can not be materially increased, some other outlet must be found, and it is fortunate that over 90 per cent of the timber is suitable for the manufacture of paper. A sale of two tracts containing pulp timber has been made, accompanied by the granting of permits for hydroelectric power by the Federal Power Commission, and the outcome will be watched with interest. It is realized that the future prosperity of Alaska is dependent to a large degree upon the utilization of the timber resources.

Water power.

The value of the Alaska forests is greatly enhanced by the fact that within their area there are undeveloped power sites capable of supplying approximately 500,000 horsepower. At present this power is valuable for local industries only, because it is not practicable to transmit it beyond the limits of the Territory. The water power is awaiting development, and the domestic market in the United States

can absorb the products. Every encouragement should be given this industry, which will provide a large number of people with year-round employment and increase the permanent population of the Territory.

Roads and trails.

The long, deeply indented coast line and numerous inland waterways of Alaska afford access to the natural resources of the southern coastal region. The large rivers with their many navigable tributaries provide access to the interior sections of the Territory, but they serve only as trunk systems and must be supplemented by roads and trails. Many of the mining districts and agricultural areas can not be brought into production unless they are made accessible. The Territorial government cooperates with the Federal Government in the construction of roads and trails. The Alaska Road Commission, War Department, is responsible for construction outside of the national forests, and the Bureau of Public Roads, Department of Agriculture, is charged with similar work in the forest reserves. The funds expended for road construction in the Territory are derived from direct appropriations by Congress, appropriations by the Territorial legislature, Alaska fund, sales of timber, and certain miscellaneous sources. During the past year new construction was confined to a few major projects.

Repeated efforts have been made to obtain the approval of a definite development program which will assure stipulated allotments for maintenance and improvement of the existing system and new construction to keep pace with the development of the Territory. Recently such a program was prepared and submitted for consideration. The total expenditures for a 10-year period aggregate \$16,547,000, of which \$2,300,000 will be provided from Territorial sources. The adoption of this plan will facilitate administration, encourage development, and reduce operation costs.

Mount McKinley National Park.

The park contains approximately 1,693,800 acres, or 2,645 square miles. This large area was reserved primarily to afford a sanctuary for the wild life within its borders.

The value of the park to the public depends to a large extent on its accessibility. The Alaska Railroad provides transportation to the entrance on the eastern boundary, and for many years this will be the only feasible route. A road has been constructed from the railroad station to a point near the Toklat River, and when this project is completed it will traverse the northern part of the park. Excellent accommodations for visitors are provided at the Savage River camp, and from this camp many interesting trips may be made by auto and pack horses. The present park boundaries should be

adjusted to conform more nearly to the natural boundaries. The road should be completed and adequate hotel accommodations provided at the railroad station. It is confidently expected that an increase in travel will follow and will be an important factor in the revenue of the Alaska Railroad.

Schools.

The Territorial and Federal Governments cooperate in an effort to provide adequate school facilities for all the children in Alaska. This presents a difficult problem, since great distances separate small communities and transportation facilities are inadequate or entirely lacking. The Territorial (white) schools are supervised by the Territorial commissioner of education and financed by funds appropriated from the Territorial treasury. For the biennium 1931-1933 the legislature appropriated \$1,174,520 for the support of these schools, the Alaska Agricultural College, and School of Mines. During the past year 88 elementary schools and 15 high schools were maintained. Two hundred fifty-nine teachers were employed for 5,304 pupils at a cost of \$595,192.70.

The Office of Indian Affairs has jurisdiction of the schools for the natives, and the funds are provided by Congress. During the year 98 day schools and three industrial schools employed 210 teachers for 4,206 pupils (natives) at a cost of \$614,624.69. Vocational training is offered in the industrial schools at White Mountain, Kanakanak, and Eklutna. A fourth institution is under construction at Wrangell and will be completed this year. These institutions provide practical training for the native children and are an important factor in preparing them to assume the responsibilities incident to earning their own living.

Labor.

The Federal mine inspector is required to compile statistics in all matters affecting labor in the Territory. His report indicates that the situation was generally satisfactory during the first six months of the period but some unemployment was reported during the spring of 1931. This is attributed to the curtailment of operations in the fishing industry and in a greater degree to the influx of laborers from outside the Territory. The situation was relieved to some extent by additional road projects and the construction of buildings in some of the larger communities. It is not anticipated that labor conditions will be serious this winter, but it is certain that there will be more than the usual number of unemployed, and in certain districts the natives will be in need of assistance. During last year wage schedules remained stabilized and there were no labor troubles. The fishing industry affords employment

to more than 80 per cent of all labor in the Territory. The mining industry absorbs approximately 15 per cent, while the railroads, road-building agencies, and logging concerns account for less than 5 per cent. During the salmon fishing season the supply of local labor is not adequate; consequently a large percentage of the employees must be imported. Many of the companies have expressed a willingness to employ more local labor if they can be assured that it will be available when the season opens. Approximately 45 per cent of the labor that is imported is engaged under a contract system.

Aviation.

Aviation in Alaska has emerged from the experimental state and taken its place among the recognized transportation facilities of the Territory. At present there are 68 landing places in strategic places. Practically every community in the interior may be served by air transportation. Anchorage, Fairbanks, and Nome have large, well-equipped fields and are headquarters for companies that are operating in the home ports for planes that serve the coastal regions.

Tourists.

A decrease of approximately 27 per cent in the number of persons traveling in Alaska is shown for the year, attributable to the prevailing unfavorable economic situation. The belief is expressed that it is only temporary. Alaska offers unusual opportunities to tourists, and as its attractions become more widely known the number of visitors will increase each year. One notable feature of the travel was the increase in the number of yachts and privately owned boats in the waters of southeastern Alaska. Many of the travelers assert that the sheltered waters along the southern coast of the Territory can not be surpassed for summer cruising. Next year an effort will be made to encourage travel and devise some plan whereby local pilots will be available for service in the more intricate passages.

THE GOVERNOR'S RECOMMENDATIONS

The Governor makes the following recommendations:

Native schools.

1. Construction of not less than 10 schools each year, until every community in Alaska is equipped with adequate facilities. A survey of the native communities in the Territory by the Office of Indian Affairs discloses that there are 25 villages with a school population of more than 25 children that have no school facilities. A greater number of small communities having a school population of 10 or more children are without schools. This should be corrected.

Medical service.

2. Safeguarding the health of the natives is one of the most important functions of the Office of Indian Affairs. There are sections of the Territory larger than some of the smaller States which are without hospitals or medical service of any kind. Practically all of the population in these sections is native. A 5-year program which will provide adequate facilities in every section should be prepared and approved. The hospital boat on the Yukon River is inadequate and should be replaced with a larger vessel completely equipped for the service. A large staff of doctors and nurses is engaged in medical work for the natives. The early appointment of a qualified medical director is urgently needed to put the service on a better operating basis. Funds are now available for this purpose.

Relief of destitution.

3. Relief of destitution among the natives is a serious problem even in normal times. In the past appropriations for this purpose have been inadequate. This year there has been more sickness than usual in many sections. Low prices and scarcity of fur have deprived many natives of their only source of income. Curtailed activities in fishing have resulted in unemployment. These factors have contributed to an abnormal condition, and during the coming winter the appeals for assistance will be far greater than ever before and more funds will be needed. Wherever there are Government schools or hospitals, it is feasible to provide work for a limited number of natives, but in many instances supplies must be purchased and distributed. An emergency appropriation to meet these needs is recommended.

Administrative changes.

4. For administrative purposes, under the Office of Indian Affairs, the Territory is divided into districts, each district being provided with a headquarters office in charge of a local superintendent. This system requires a duplication of records and unnecessary correspondence. The discontinuance of the district offices and the appointment of inspectors under the general superintendent would promote efficiency and permit better coordination of the work.

Reindeer industry.

5. The reindeer council has prepared a plan for an organization to supervise the reindeer industry. The program was suggested by a committee appointed by the Secretary of the Interior. Estimates covering the cost of the proposed organization are requested. When the proposed organization is complete, the teachers in the schools con-

ducted by the Indian Bureau will be relieved of their duties as reindeer supervisors, but until that time they must continue such duties.

Yukon River fisheries.

6. The Yukon River has been closed to commercial fishing for several years, and reports indicate that the runs are again normal. This closing deprived the natives and other residents of the lower Yukon of one source of income, and they are sorely in need of assistance now. Limited commercial fishing by bona fide residents is recommended if investigations by the Bureau of Fisheries disclose that such action can be taken without jeopardizing the future supply or depriving the residents along the upper reaches of the river of their food.

Roads—10-year program.

7. The Alaska Road Commission has prepared and submitted a tentative 10-year program of maintenance and improvement of the existing road system outside of the national forests. It is designed to enable the commission to coordinate and reduce maintenance and construction costs. The approval of the program is urged.

Improvements to navigation.

8. Recommendations for the improvement of Dry Pass are before Congress. Reports on proposed improvements of Gastineau Channel and Sitka Harbor have been submitted to the Chief of Engineers, United States Army. Surveys are authorized to determine the feasibility of improving the Stikine River channel, Wrangell Harbor, Petersburg Harbor, and Salmon River. These projects, which are essential to the future development of the Territory and its industries, should be authorized. If the work can be undertaken next season, it will relieve the local unemployment situation.

Restrictions on placer mining.

9. The repeal of existing restrictions which limit the locations of placer claims is urged by commercial organizations and the Alaska Legislature. The present law discourages the exploitation of low-grade placer deposits and should be amended to conform to the mining legislation of the public-land States.

Charting of waterways.

10. Glacier Bay and many of the other large inlets have not been charted in sufficient detail. These waters should be wire dragged and the charts brought up to date. Each year there is an increasing number of pleasure craft in the Territory, and every effort should be made to encourage this travel.

Mount McKinley National Park.

11. The present boundaries of Mount McKinley National Park are not satisfactory and should be changed to conform more closely to the natural boundaries. Some of the lands now within the park should be excluded and other areas included. Appropriate legislation is recommended.

Fur-bearing animals.

12. In many sections of the Territory the natives rely on the fur-bearing animals as their principal source of income. Last year there was a scarcity of fur and low prices prevailed. As a result the trappers are confronted with a serious situation, and unless relief is afforded there may be much distress. An open season on all small fur-bearers is recommended in all sections where this is possible without endangering the future supply.

Prior recommendations renewed.

13. The governor renews his recommendations, contained in previous annual reports, for an investigation of the halibut fisheries in Bering Sea; a revenue cutter to serve western Alaska during the winter season; authorization of air mail service on established routes; and construction of additional Federal buildings, which, he states, are much needed.

THE ALASKA RAILROAD

SUMMARY OF THE GENERAL MANAGER'S REPORT

The physical condition of the road, structures, and equipment showed marked improvement at the end of the fiscal year.

Owing to heavy rains during August, 1930, the rehabilitation program consisting of ditching, bank widening, grade raising, ballasting of the roadway, and other improvement work was suspended for that season on August 14. This work was resumed in the spring as soon as weather conditions permitted, and at the end of the fiscal year the ballast work between Miles 359.3 and 385.2, distance 25.9 miles, had been completed. There remains approximately 180 miles to be ballasted; when finished the maintenance cost will be about \$160,000 less per annum.

Heavy rains continued during September, 1930, resulting in extremely high water in the Nenana River, which caused several wash-outs at various points on the Healy and Nenana divisions. The most serious occurred at north approach to bridge at Ferry and at Mile 379.5, where the Nenana River washed away 300 feet of embankment for a distance of 900 feet, necessitating the construction of a diversion dam to guard against further wash. The cost of repairs was approximately \$105,000, including cost of diversion dam.

During the spring of 1931 all freight and passenger tariffs were reissued. Freight tariffs were compiled so as to give a new rate varying from 35 to 70 per cent higher on different commodities than the old rate, and passenger rail-line tariff was revised increasing rate $66\frac{2}{3}$ per cent, to 10 cents per mile. It is the opinion that the increase of passenger rates has and will continue to adversely affect this source of revenue, particularly the local travel, which has shown a steady decline since its inception. An increase in freight tonnage occurred prior to freight-rate increases. This was caused by merchants stocking up in advance, with resultant decrease of tonnage in the following months, which effect will continue until the oversupply has been exhausted. Therefore comparison can not be made accurately at this time and should be deferred until it can be made on the basis of traffic for a full year.

While the world-wide depression caused a reduction in passenger revenues, there was a slight increase in freight revenue of the Alaska Railroad. A very creditable showing was made in reduction

of total expenses from \$2,418,550 in 1930 to \$1,727,784 in 1931, a decrease of \$690,766, with lowering of the deficit from \$1,237,120 in 1930 to \$589,750 in 1931, a decrease of \$647,370. This result was made possible through decreased train mileage, reduction in forces, efforts to improve operating efficiency, and other means of economy.

The pay roll for 1930 amounted to \$1,977,866.88, while in 1931 it amounted to \$1,430,081.92, a decrease of \$557,784.96. The average number of employees was 969 in 1930 and 671 in 1931.

Investigation of mineral, coal, and other resources.

The necessity of estimating and inventorying the mineral resources of the Territory adjacent to the Alaska Railroad that might contribute to the tonnage handled by the railroad has long been realized. Until recently, however, it had not been possible to attack the problem intensively, but through the Interior Department appropriation act for 1932 Congress supplied the railroad with funds "for continuation of the investigation of mineral and other resources of Alaska to ascertain the potential resources available which will affect railroad tonnage." Detailed examinations are being conducted in a number of places with a view to determining the potential resources of gold, copper, silver, lead, zinc, coal, diamonds, antimony, clay, and limestone, and there can be little doubt that these examinations when concluded will have a stimulating effect upon the mineral industry adjacent to the railroad by assisting the small operators or prospectors with sound technical advice so their endeavors may be applied most effectively, or by accumulating an authoritative body of information regarding the actual conditions in each of the districts studied and bringing this information to the attention of the capitalists and others who may be on the lookout for opportunities to participate in promising enterprises, or by interpreting the observed facts regarding the occurrences of ores in the different districts so as to draw inference as to the places where geological conditions appear to be most favorable for finding new deposits, or to point out the unfavorable indications that should be avoided.

Agricultural development.

Progress was made on the project of development and settlement of agricultural land adjacent to the Alaska Railroad with a view to increasing the railroad revenue. Public lectures, illustrated by lantern slides showing farming and other industries, were given in 24 cities and communities in the States and 190 personal contacts were made with prospective settlers. A poster with illustrations of Alaska farming scenes and data on farming in the Territory and soliciting inquiry was posted in the lobby of every post office in

the Northwestern and mid-western States, and 3,150 letters of inquiry were received and answered. Owing to the depressed conditions many interested farmers in the States are unable to dispose of their present holdings, but a number of them have indicated that they will do so at the first opportunity and then settle on a homestead in Alaska. During the year 49 men were shown over the Matanuska Valley for the purpose of selecting homesteads. In addition a number of home seekers who have become interested through the efforts of the Alaska Railroad have come to the Territory and are investigating conditions independently, and an increased number of local residents have filed on homesteads during the past year.

Reindeer industry.

The expected expansion of the reindeer industry did not materialize this year, but every effort is being made toward interesting financial support to undertake development of this industry.

Financial.

Passenger revenue from rail operation for the fiscal year amounted to \$191,475.06, a decrease under the previous year of \$8,959.11, or 4.46 per cent.

Freight revenue from rail operation for the fiscal year amounted to \$688,440.14, an increase over the previous year of \$10,687.98, or 1.57 per cent.

Rail operating revenue from all sources was \$1,053,455.93, a decrease of \$46,387.29, or 4.21 per cent.

Passenger revenue from river-boat operation for the fiscal year amounted to \$14,763.20, an increase over the previous year of \$253.25, or 1.74 per cent.

Freight revenue from river-boat operation amounted to \$42,126.30, an increase of \$468.04, or 1.12 per cent.

All revenue from river-boat operation amounted to \$84,577.94, an increase of \$2,991.73 or 3.66 per cent.

Revenue from all sources including nonoperating income was \$1,147,628.86, a decrease of \$38,922.55, or 3.28 per cent.

Rail-line expenses for maintenance and operation amounted to \$1,632,662.37, a decrease under the previous year of \$688,547.66, or 29.66 per cent.

The operating ratio of the railroad decreased from 209.34 in 1930 to 154.31 in 1931.

Including replacements, expenses decreased \$688,547.66, or 29.66 per cent.

River-boat expense was \$95,122.05, a decrease of \$2,217.47, or 2.27 per cent.

Total expenses for rail and river boats were \$1,727,784.42, a decrease of \$690,765.13, or 28.56 per cent.

Deficit for rail operation was \$579,206.44, a decrease of \$642,160.37, or 52.57 per cent.

The river boats were operated at a loss of \$10,544.11 as against a loss of \$15,753.31 in 1930.

Total deficit for rail and river-boat operation was \$589,750.55, a decrease of \$647,369.57, or 52.32 per cent.

Maintenance.

Six passing tracks built primarily for use during construction days were removed, effecting a saving of approximately \$2,000 per annum in maintenance cost and supplies, and five more such tracks will be taken up in the near future.

Trestle bridges to length of 788 feet were filled in with gravel, and 990 lineal feet of contract pipe, from 18 to 48 inches in diameter, was laid under roadbed, replacing wooden culverts and filled-in bridges.

The work undertaken at the close of last year of moving main line at Mile 118 to eliminate curvature was completed early this year. The track was moved from 1 to 250 feet in places.

It is the intention during the coming year to raise the roadbed at Milepost 58 to prevent water standing on the track for a distance of three-quarters of a mile during snow-melting season. Water would not flow away, owing to the depth of snow on both sides of the roadbed.

Tie renewals for the year amounted to 87,818, which is 86,962 less than the previous year.

Transportation.

Operating conditions during the year were good, excepting numerous mud and rock slides and washouts which occurred in the months of August and September, following heavy rains. Snow conditions were not abnormal. The cost of removing snow, ice, and sand was \$91,884.10 as compared with \$98,572.58 the previous year, the reduction being due partly to use of improved equipment.

THE TERRITORY OF HAWAII

SUMMARY OF THE GOVERNOR'S REPORT

The Governor of Hawaii, Hon. Lawrence M. Judd, in his annual report, shows that the islands are in a healthy economic condition, while not quite at the peak attained in 1929. Following are the outstanding features of the report:

Population.

The population of the Territory, according to the Federal census of 1930, is 368,336. This is an increase of 44 per cent over 1920. Based upon the 1930 census of the United States, the distribution of the population on June 30, 1931, by race, was estimated by the board of health to be as follows:

	June 30, 1931		June 30, 1931
Hawaiian.....	22, 391	Chinese.....	27, 317
Caucasian-Hawaiian.....	16, 454	Japanese.....	143, 754
Asiatic-Hawaiian.....	13, 549	Korean.....	6, 583
Portuguese.....	28, 219	Filipino.....	66, 049
Porto Rican.....	6, 886	All others.....	786
Spanish.....	1, 255		
Other Caucasian.....	41, 968	Total.....	375, 211

Commerce.

Exports from Hawaii to foreign countries and the mainland of the United States during the past year were in value nearly \$10,000,000 in excess of imports. The value of exports was \$100,913,783 and of imports \$91,213,049.

Cane sugar.

The production of raw sugar continues to be Hawaii's main industry. For the year ended September 30, 1930, the production was 924,463 tons. The value of sugar exported to the mainland of the United States and to foreign countries during the calendar year 1930 was \$55,233,469.

Pineapples

A total of 12,672,000 cases of pineapples were packed this year, which is 30 per cent more than any previous year. The sales have been satisfactory. The pineapple fields are in excellent condition, and progress has been made in the control of plant diseases and pests.

Tourist trade.

The tourist trade has been referred to as Hawaii's "third industry." While large in 1930, there was a decrease of about 15 per cent from 1929, which is referred to as the "banner" year.

Health.

The health record of the Territory for the year is good. The infant mortality rate was the lowest yet recorded, being 75.99 per 1,000. The death rate also showed a decrease, being 10.20 per 1,000 population as compared to 10.84 for 1930. Large sums have been appropriated so that medical service may be made available to those unable to command it.

Public education.

The enrollment in the public schools increased approximately 5 per cent, bringing the total of pupils to 76,634. This per cent of increase is slightly less than that for the previous 10 years. An increased interest in public education on the part of both teachers and the community has been apparent. Notable progress has been made in the better adaptation of education to the actual life of the students.

A comparative table of racial descent of pupils attending the public schools on June 30, 1931, is as follows:

Racial descent	Number of public-school pupils	Per cent of total	Racial descent	Number of public-school pupils	Per cent of total
Hawaiian.....	3,206	4.19	Japanese.....	41,251	53.90
Part Hawaiian.....	8,073	10.55	Korean.....	1,859	2.43
Portuguese.....	5,881	7.69	Filipino.....	3,807	4.97
Porto Rican.....	1,257	1.64	All others.....	907	1.19
Spanish.....	253	.33			
Other Caucasian.....	3,210	4.19	Total.....	76,530	100.00
Chinese.....	6,826	8.92			

An important act passed by the 1931 legislature made the Territorial normal school into a full 4-year teachers' college affiliated with the University of Hawaii. It is confidently expected that this will mean much to the future development of both the normal school and the university and result in a definite improvement in teacher training. This legislature also authorized the reorganization of the department of public instruction.

Progress has been made during the past year in the development of vocational education, which is a matter of much importance in Hawaii and the problem a difficult one. The program for trades and occupations has worked satisfactorily. Both boys and girls are instructed, but along separate lines. Vocational training is

given in some eighth grade schools, high schools, and the Honolulu Vocational School.

Agriculture offers the largest occupational field in Hawaii and also the most serious problems. It is extremely difficult to recruit students for vocational agriculture. Parents do not generally encourage their children to join the classes and in many cases actually oppose their enrollment. This lack of interest or opposition appears to be based on a feeling that their children may find better occupational opportunities elsewhere, and that they wish their children to enjoy greater social and economic advantages than they see in their own environment.

A survey of food conditions made at the leper settlement of Kalaupapa, in the island of Molokai, resulted in the organizing of classes for meal preparation. Since food and diets are an important phase of the treatment of leprosy, and since the patients are much in need of simple instruction in meal preparation, classes were immediately formed. A nonleper has been secured for a teacher and classes are now being carried on in some of the institutions and are also reaching patients living in their own houses. Reports show that food habits have improved at the leprosarium.

The home-economics program has made excellent progress. The regular day-class enrollment has increased from 432 in 1928 to 1,768 in 1930.

At the University of Hawaii there were 100 graduate students, 992 regular undergraduates, and 396 part-time students, a total of 1,488. This is an increase of 167 over the previous year.

Public works.

Expenditures by the Territory on public works amounted to \$1,493,-632.71. Included in this figure is the sum of \$471,112.21, Federal road-aid funds. For new wharves and the maintenance of old ones there was expended \$592,587.80.

The reconstruction of the new capitol building, for which provision was made by the 1929 legislature, has now been completed. The cost was approximately \$165,000.

A contract for the construction of an armory at Hilo, at a cost of \$78,528, has been let.

The Territorial highway department has carried on an unusually large amount of important work this year, due to the allotting of \$400,000 of emergency funds, which was Hawaii's proportion of the \$80,000,000 passed by Congress in December, 1930.

Finances (governmental).

The gross assessable value of real and personal property amounted in 1931 to \$390,556,301, a decrease of 6.363 per cent over 1930. Tax rates in all taxation divisions increased. For the first division the

tax rate is 4.003; second division, 3.935; third division, 4.341; fourth division, 3.631. The bonded debt of the Territory was increased by \$295,000, making the aggregate of bonds outstanding \$32,000,000.

Finances (private).

Commercial deposits in banks amounted to \$42,217,616.83; savings deposits, \$41,587,979.74. There were 176,072 savings accounts, averaging \$236.19 per account. Eighty-eight corporations were created during the year, and 34 dissolved, leaving on June 30, 1931, 1,233 domestic corporations with a total capitalization of \$347,232,463.

Public lands.

The public lands of Hawaii have an estimated total area of 1,590,000 acres. These lands, with the exception of areas set aside for special purposes, are administered by the commissioner of public lands and are homesteaded, sold, leased, or exchanged in accordance with the provisions of section 73 of the Hawaiian organic act as amended.

The collections by the office of the commissioner of public lands from all sources for the fiscal year July 1, 1930, to June 30, 1931, totaled \$852,364.05. Of this amount \$668,521.67 was for land rentals, \$152,574.08 for sales of public lands, \$27,428.12 for interest on sales of public lands, \$1,648.78 for interest on current deposits, and \$2,191.40 for miscellaneous revenue. The amount of this revenue diverted for the use of the Hawaiian Homes Commission was \$190,913.33.

The Federal Government, by act of Congress approved in June, 1930, ordered that all rentals accruing from licenses or leases on Government lands in Hawaii, taken over for military purposes and negotiated for by the War Department, be paid into the treasury of the Territory of Hawaii.

Hawaii National Park.

The Hawaii National Park (created August 1, 1916) is unique in that it consists of two separate tracts of land in different islands. The Kilauea and Mauna Loa areas are on the island of Hawaii and the Haleakala on the island of Maui. The total area of the park is 245 square miles, of which 219 square miles are in the Kilauea-Mauna Loa section and 26 in the Haleakala section.

In the past year important additions have been made to the park staff and better service to the public provided. The improvements include the building of a telephone system, erection of a new lecture hall, employees' quarters, etc., and the building of new trails. The travel figures for the year are 98,895, as against 89,578 in 1930.

The educational work of the park was stimulated by the appointment of a park naturalist during the year. Lectures were given at the Uwekahuna Observatory. Visitors and special parties were conducted over the roads and trails to points of interest; a monthly publication, *Hawaii Nature Notes*, was started, and the University of Hawaii cooperated with the park service in summer-school classes in natural history.

Forest reserves.

During the year 42,117 acres were added, by proclamation of the governor, to the forest reserve system, bringing the total area of forest reserves up to 1,021,314 acres. Of the lands in the 63 reserves on the five largest islands, 65 per cent is owned by the Territory. Of the privately owned lands 13 parcels, consisting of 21,439 acres, have been turned over to the complete control of the Territory for various periods. One-fourth of the total land area of the territory is now under forest protection, and it is felt that is none too large a proportion to guarantee an adequate water supply.

The work of taking care of this scattered but important forest estate has been advanced during the year. Open areas have been planted at the rate of about 28,000 trees per month. In October, 1930, a grove of 1,000 coconut trees was planted at the Mokapu game farm on Oahu in commemoration of the life of George Washington, as suggested by the American Tree Association.

Efforts to eradicate destructive wild stock in and near forest reserves have been continued with excellent results. In the districts of Kau and Kona, on the island of Hawaii, over 7,000 wild goats have been eliminated.

Federal receipts.

The custom receipts for the year amounted to \$1,908,632.18, the second highest figure in the history of the Territory. The internal-revenue receipts were \$4,816,475.31. The governor states that this sum is more than the amount paid into the Federal Treasury by 13 of the States.

Transportation.

There were 1,283 vessels, with a registered tonnage of 10,355,882, entered Hawaiian harbors during the year. Commercial airplanes, operating between the various islands, flew 278,690 miles in 2,987.67 hours, carrying 12,206 passengers. There were 47,410 privately owned motor vehicles registered on June 30, 1931, this figure being more than double the number registered in 1925.

THE VIRGIN ISLANDS OF THE UNITED STATES

SUMMARY OF THE GOVERNOR'S REPORT

The Governor of the Virgin Islands, Hon. Paul M. Pearson, in his report for the fiscal year ended June 30, 1931, shows that industrial and agricultural conditions in the islands continue to be very unsatisfactory, and that there is little or no prospect for the immediate future that their people will be self-supporting.

Geographical location.

1. The group of islands called the Virgin Islands of the United States comprises the islands of St. Thomas, St. John, and St. Croix, with about 50 islets, mostly unnamed and uninhabited, lying about 60 miles due east of Porto Rico. The total area of the islands is about 132 square miles (about one-tenth of that of the State of Rhode Island).

Historical sketch.

2. The Virgin Island group was discovered by Christopher Columbus on his second voyage. He found the island of St. Croix populated by Carib Indians, a race of fierce warriors and courageous travelers. It has never been accurately determined exactly how long after the discovery of these islands the Caribs continued to inhabit them. It is claimed that the Indians were driven away from the Virgin Islands in the reign of Charles I of Spain, about the year 1555, the Emperor having directed that they be treated as enemies and exterminated.

Danish, English, Dutch, and French settlers came to the Virgin Islands during the seventeenth century, the first recorded settlement being made on the island of St. Croix in 1625, the first recorded settlement on St. Thomas in 1666, and upon St. John in 1684. At the time these settlements were made there were no Indian inhabitants in the islands.

The islands of St. Thomas, St. John, and St. Croix, comprising the Danish West Indies, were under the control of the Danish West India & Guinea Co. until the year 1754, when the company's shares were sold to King Frederick V, of Denmark, and the islands came under the direct control as royal colonies. Several minor slave insurrections took place at various times in St. Croix, under Danish rule. All were quickly quelled until the one which many years

later culminated in the complete emancipation of all slaves in the islands. This was in the year 1848, or 15 years before the emancipation of slaves in the United States.

The Danish West Indies, now known as the Virgin Islands of the United States, were acquired by the United States from Denmark in 1917 for \$25,000,000.

Climate and rainfall.

3. The climate of the Virgin Islands is remarkably fine. While the islands are situated within the Tropics, the heat of the tropical sun is tempered by the refreshing trade winds which blow constantly.

The rainfall is not excessive, averaging about 47 inches per year. May, August, September, October, and November are usually the rainy months. However, in St. Croix the rainfall varies greatly, making the raising of sugarcane, the principal product of the island, extremely hazardous. Periods of drought running over a number of years are of frequent occurrence and cause untold damage to the sugar crops.

The months of June to November are known as the hurricane season. Devastating hurricanes are not of frequent occurrence, destructive storms having visited the islands in 1713, 1738, 1742, 1772, 1793, 1819, 1837, 1867, 1916, 1924, and 1928.

Population.

4. There are approximately 22,000 people living in the islands, classified into four major groups, as follows:

	Per cent
White-----	7.4
Negro-----	74.9
Mixed-----	17.5
All other-----	.2

The term "mixed" is used to designate persons of mixed white and negro blood.

Economic conditions.

5. The economic decline of the Virgin Islands, which began more than 150 years ago, has continued gradually up to the present, with the immediate future holding little promise for betterment. Wages are extremely low and considerable unemployment exists. With the decline of the shipping industry at St. Thomas and the threatened complete collapse of the sugar industry in St. Croix, unemployment is increasing. The new civil government is applying itself vigorously to the introduction of new activities, such as handicraft, employing hundreds of natives in needlework, basketry, cabinet-making, etc., and the expansion of cattle raising, bay-rum industry, dairying, fisheries, and vegetable gardens, as a means of alleviating the distress occasioned by increasing unemployment in shipping

and sugar industries, which have previously provided a means of livelihood for the masses.

Rehabilitation.

6. The rehabilitation program, approved and appropriated for by Congress, is as follows:

Homesteading -----	\$106, 000
Hotel -----	60, 000
Agricultural and vocational school -----	50, 000

These projects have been given careful study by the governor and the Interior Department, and tentative plans have been drawn up for their consummation. During the coming fiscal year it is hoped that this rehabilitation program can be put into successful operation. The homesteading plan particularly carries great promise of beneficial results for the people.

Public works.

Some improvement has been made in road conditions throughout the islands during the past fiscal year, but very little can be expected in the way of good roads until appropriations become available for the purpose of more permanent construction. The present dirt and stone roads are washed away and become impassable with each torrential rainstorm, and repair and maintenance charges are extremely large. While a program of more permanent road construction would involve a considerable capital outlay, spread over a period of years, it would prove economical in the long run, with the reduction in road maintenance, repair and reconstruction necessary with the present dirt and stone roads.

An appropriation in amount of \$15,500 is available for the reconstruction of the Christiansted Reservoir, in St. Croix, in order to provide pure drinking water. Plans have been drawn up for a reservoir which will adequately serve the people, and the work of reconstruction is now in progress.

Public health.

While the climatic conditions of the islands are excellent, the low standard of living and malnutrition create a health problem of the utmost importance. The death rate is abnormally high, being about three times that of the United States. In St. Croix it exceeds the birth rate. Infant mortality, due largely to malnutrition and gastric-intestinal diseases, plays a conspicuous part in the high death rate. Until the people are able to improve their standard of living and secure a better balanced diet the health problem will continue acute.

Schools.

The total enrollment during the past fiscal year in both public and private schools was 4,238, of which 1,106 pupils were enrolled in

private schools and 3,312 in public schools. The enrollment remains practically the same, with a slight increase over the previous year. It is interesting to note that the enrollment in Grade I has been gradually diminishing since 1920, from 997 to 565 in 1931. In the more advanced grades the enrollment has been gradually increasing.

Finances.

Budgetary problems, never a simple matter in a community that is not self-supporting and complicated this year by the falling off of revenue in both municipalities due to the economic depression, were still further complicated by the change of government and the withdrawal of naval activities. As the municipalities are not self-supporting, and as Congress appropriates funds to meet their deficits, it follows that all municipal revenue must be expended before Federal funds are used, and that there can never be a surplus in the municipal treasuries. A revision in the tax system of the islands is planned in order to secure additional taxes as a partial offset of decreasing tax revenues in other directions.

ELEEMOSYNARY INSTITUTIONS

ST. ELIZABETHS HOSPITAL

SUMMARY OF THE SUPERINTENDENT'S REPORT

St. Elizabeths Hospital, which is recognized by the American Medical Association as a class A institution, is devoted to the treatment of insane patients of the Army (including civilian employees in the quartermaster pay class), the Navy, the Marine Corps, the Public Health Service, members of the Coast Guard, Veterans' Bureau beneficiaries, and members of the foreign legions or participants in recent wars in the ranks of foreign allies, under reciprocal arrangements; insane residents of the District of Columbia, United States prisoners before and after conviction, inmates of the National Home for Disabled Volunteer Soldiers and of the Soldiers' Home, Washington, D. C., insane American citizens in the Canal Zone whose residence in the United States can not be ascertained, interned persons and prisoners of war under the jurisdiction of the Navy and War Departments, respectively, American citizens who have been legally adjudged insane in the Dominion of Canada, and beneficiaries of the United States Employees' Compensation Commission.

On June 30, 1931, 4,721 patients remained in the hospital. The total number of patients under treatment during the year was 5,354. The total number of discharges, including deaths, was 633. The daily average population was 4,602, an increase of 212 over the preceding year. The total number of deaths was 211, as compared with 204 for the previous year.

Movement of patient population, fiscal year 1931

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1930.....	2,484	649	3,133	830	540	1,370	4,503
Admitted during year ended June 30, 1931.....	526	114	640	120	91	211	851
Total number under care and treatment during year ended June 30, 1931.....	3,010	763	3,773	950	631	1,581	5,354
Discharged as—							
Not insane.....	14	2	16	0	1	1	17
Recovered.....	106	3	109	16	8	24	133
Improved.....	133	6	139	12	8	20	159
Unimproved.....	98	8	106	4	3	7	113
Total discharged.....	351	19	370	32	20	52	422
Died.....	97	37	134	50	27	77	211
Total of patients discharged and died.....	448	56	504	82	47	129	633
Number of patients remaining on rolls June 30, 1931.....	2,562	707	3,269	868	584	1,452	4,721

The most significant and outstanding single fact regarding the hospital for the past year has been the increased rapidity with which it has grown in size and the consequent acutely overcrowded condition. The past two years have seen an increase of approximately 200 patients per year in the total population, and at the close of the fiscal year there were 4,721 patients, representing an overcrowded condition of over $33\frac{1}{3}$ per cent according to the result of a survey of the situation made by the Comptroller General in 1926, wherein he estimated that the normal capacity of the institution was 3,300 patients. To that has been added since then only 200 beds in the new medical and surgical building completed last year. To correct this situation, Congress was appealed to, with the result that there was appropriated \$240,000 for a new tuberculosis building with a capacity of 30 beds, \$825,000 for two continuous-treatment buildings each to contain 164 beds together with the necessary kitchen and dining rooms, and \$1,050,000 for a new male-receiving building to contain 400 beds. The rapid increase in the size of the hospital in the past few years, which has necessitated the new construction above described, also called for consideration for the future, and so at the time the plans were made for the buildings which have already been appropriated for a scheme for future extension was also worked out which will take care of the growth of the institution for some years to come. One of the most important factors in that scheme is the provision of additional land which will be made necessary because of the gradual taking over of farm land for building sites, and for roadways and boulevards in connection with the development of the city. This plan involves the erection of some nine additional buildings, the extension and enlargement of the power house and the addition of several thousand acres of land to the hospital site. The sites for all of these buildings have been located, and the scheme providing for the necessary connections for power, heat, light, water, and sewage includes provision for the buildings already appropriated for. The main construction for these purposes is the building of a 6 by 7 foot tunnel from power house to the new building sites, which will carry these utilities and which was provided for in the appropriation act. There was also provided in this act the necessary language permitting of the change of location of certain smaller buildings, namely, three tuberculosis buildings and a shop building, to new sites, in accordance with the general scheme developed. At the close of the fiscal year the tunnel is already under construction, and the contract for the erection of the tuberculosis building has been signed. Inasmuch as the power plant was already taxed to capacity, it had been necessary in the meantime to install a new 500-horsepower boiler, and the

installation of a 1,000 kilowatt turbogenerator has been contracted for. Thus by the time the new buildings are erected adequate power, heat, and light can be supplied.

The past year, with the increased patient load that the hospital has had to care for, has been a very active one.

The supplies produced on the hospital reservation, including farm and garden products, shoes, brooms, articles made in sewing and mending rooms, output of the bakery, laundry, power, heat, and lighting plant, mattress shop, etc., were valued at about \$817,000 during the year 1931, an increase of about \$67,000 over the previous year. Included in this were 20,000 gallons of ice cream, 297,000 gallons of milk, 14,860 dozen eggs, 1,100 bushels of tomatoes, 139,000 pounds of fresh pork, 914,000 loaves of bread, 3,100,000 rolls, 65,000 pounds of pastry, 7,725,000 pieces of laundry, 5,500 brooms, 1,875 brushes, 1,700 mattresses, 1,850 pillows, 10,300 pairs of shoes and slippers, besides steam, electricity, water, ice, and refrigeration, and many similar items.

The Holstein-Friesian herd has again been tested for tuberculosis without showing any reactions. This is the seventeenth year that the herd has tested free of tuberculosis, and we believe it to be one of the largest accredited herds in the country. It contains approximately 400 head, including cows, calves, heifers, and bulls, and the average production of milk per capita during the past year has been 12,269 pounds. Aside from this comparatively high average production, the quality of milk has been eminently satisfactory as tested by the bacterial content. The average count has shown 6,000 colonies per cubic centimeter, which is well within the requirements for certified milk. Only four counts were above 10,000, the highest being 14,000.

The shoe shop is now producing all of the shoes used at the hospital and in doing so furnishes employment to some 30 patients for about 5½ hours per day.

The major activities of construction aside from those mentioned have been the building of concrete roads, the laying of sewer lines, laying concrete foundations for the new boiler and turbine at the power house, the remodeling of the old center lodge, the construction of a pipe tunnel from the power house to the site of the new buildings, remodeling of the water sections in the older portions of the institution, maintenance of the railroad track, fire protection, and major repairs.

The Red Cross has continued to maintain its unit at the hospital. It furnishes a great deal of very acceptable recreation but in addition enables the hospital to contact with patients, their families, and relatives practically everywhere in the world, and thus becomes of inestimable service in assisting to clear up difficult problems that

arise from time to time. They assist in securing psychiatric histories, in verifying facts furnished by patients or relatives, in making previsit or predischARGE investigations, in securing reports of adjustment of patients on visit outside the District of Columbia, in securing information about and effecting the adjustment of financial problems in the patients' homes which were connected with or incidental to the patients' mental breakdown, contacting with local chapters in towns in which the patients' families live so that they can take care of any social problems which may exist in the patients' homes, locating missing relatives of patients, establishing patients' legal residences, seeing that children and wives resident outside the District of Columbia may have blood tests when advisable, having patients' families visited by a social worker with a view to explaining the advantages of having unrecovered patients remain in the hospital when they are requesting discharge, giving assistance in filing pension claims, securing information that may be needed in regard to insurance, Federal bonus, or affidavits, writing letters for patients, visiting patients in the wards, and seeing that they are furnished with books, magazines, tobacco, etc.

Eight students were graduated in the nurse and psychiatric-aide class during the year. The total number of students on the rolls of the Training School for Nurses, July 1, 1930, consisted of 3 seniors, 25 intermediates, 30 affiliates, and 1 postgraduate student. On October 1, 1930, a class of 38 preliminary students, 5 of whom were dropped and 2 resigned during the first six weeks, was admitted to the school. Other resignations and changes of the students have taken place during the year. At the present time the hospital has the largest class in its history, with a large intermediate class and a larger preliminary class, both advancing, and a new class starting in the fall. With an increased number of affiliates it means that there will be more than 100 students, of the various classes, during the coming year. Attendants' classes have been held for a period of three months. Forty aides have completed the required course, and there are now enrolled about 26 members in this course. In an attempt to meet the requirements of both the New York and the District of Columbia examining boards the Nurses Home has been remodeled and is now sufficient to meet the requirements of both boards. Two of the St. Elizabeths Hospital students took the District of Columbia board examination in April, and passed with grades of 90 and 87, making an average for St. Elizabeths nurses of 88.50, which was the highest average made by any school in the district.

FREEDMEN'S HOSPITAL

SUMMARY OF THE SUPERINTENDENT'S REPORT

Freedmen's Hospital was established under the War Department by the act of March 3, 1871 (16 Stat. 506), and subsequently transferred to the Interior Department by the act of June 23, 1874 (18 Stat. 223). Prior to 1871 the hospital was under control of the War Department as an adjunct of the Freedmen's Bureau, which was established principally for the care of the refugees who came to Washington in large numbers following the close of the Civil War.

On June 30, 1930, there were 202 patients remaining in the hospital, of whom 46 were pay patients. During the year 4,134, including births, were admitted into the hospital, making a total of 4,336 indoor patients under care. Of the number admitted, including births, 871 were pay patients, 1,199 were indigent residents of the States, and 2,064 were indigent residents of the District of Columbia.

There were discharged during the year 4,148, including 320 deaths, or 11 less than the preceding year. Thirty-four per cent of the deaths occurred within 48 hours after admission.

There were 8,308 treated in the out-patient department, 4,950 in the emergency department, and 29,597 revisits were made to the various clinics.

The social service department completed its first year of work with some degree of satisfaction, notwithstanding the lack of clerical assistance. This branch of the hospital service can not be expected to continue to function properly without a full-time clerk. It is very urgent therefore that provision for one be made in the next appropriation act.

The construction of the clinical building, authorized by the last Congress, will require an increase in the personnel of three head nurses and three orderlies. Two firemen, 1 laundress, 1 waiter, and 1 cook are also needed so that the hospital might at least have the minimum force of employees required for its satisfactory operation.

In considering all the needs of the hospital a building for resident internes can not be overlooked. Twenty years ago the present quarters were quite sufficient, but the hospital has steadily grown and space for internes has not kept pace. Sleeping and toilet facilities are inadequate even for the present force of internes. The situation will be aggravated further by the additional internes required on account of the new maternity wing. It is estimated that a satisfactory building for this purpose would cost not more than \$40,000 and provide adequate quarters for resident internes for some time to come.

The immediate problem confronting the hospital is how the power plant will satisfy the demands for heat, light, and power during the coming winter and following year. The requirements for the heating and lighting of the new clinical and maternity buildings of the hospital, together with the three large dormitories of Howard University, now nearing completion, will place a load on the power plant far beyond its capacity. Immediate steps should be taken to provide the heat, light, and power needed for the university in excess of the capacity of the present hospital plant to supply.

The school of nursing had a very successful year. The changes in the curriculum, made last year, proved beneficial.

The superintendent of nurses is of the opinion that six graduate nurses should be employed for general duty at night. In this opinion, the superintendent concurs. It will enable the nursing department to offer better care for the patients and to conduct the training of student nurses more adequately, and within the requirements of State nursing boards. The education of the nurse to-day is so important that the assistance of graduate nurses for general night duty is absolutely essential.

Receipts and disbursements, 1931

Receipts:

Appropriation, Interior act—

Salaries.....	\$181,500.00
For support	87,500.00
Obstetrical addition.....	155,000.00

424,000.00

From pay patients.....	20,569.75
From Veterans' Bureau.....	8,101.00
From Howard University.....	33,293.45

Total.....	485,964.20
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Disbursements:

Miscellaneous (fuel, light, clothing, medicine, etc.).....	71,251.50
From pay patients.....	20,512.34
Subsistence.....	47,662.92
From pay patients.....	6,855.58
Salaries.....	177,856.96
Obstetrical addition.....	89,766.62
Refunds, pay patients.....	315.50

Total.....	414,221.42
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Unexpended balances:

Miscellaneous.....	1,035.52
Subsistence.....	837.01
Salaries.....	3,643.04
Pay patient.....	993.83
Obstetrical addition (available for expenditure during 1932) ..	65,233.38

Total, unexpended balances.....	71,742.78
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HOWARD UNIVERSITY

SUMMARY OF THE PRESIDENT'S REPORT

The Howard University was incorporated by the act of March 2, 1867 (14 Stat. 438). The object of the incorporation named in the first section of the act was "For the education of youth in liberal arts and sciences." It is declared that the incorporators shall be "a body politic and corporate with perpetual succession." The management and control of the institution are vested in a board of not less than 13 trustees; the full board, however, consists of 24 trustees.

Section 8 of the act providing for the incorporation of Howard University, above mentioned, was by act of Congress approved December 13, 1925 (45 Stat. 1021), amended to read as follows:

SEC. 8. Annual appropriations are hereby authorized to aid in the construction, development, improvement, and maintenance of the university, no part of which shall be used for religious instruction. The university shall, at all times, be open to inspection by the Bureau of Education and shall be inspected by said bureau at least once each year. An annual report, making a full exhibit of the affairs of the university, shall be presented to Congress each year in the report of the Bureau of Education.

Students.

The total enrollment of the university for the year 1930-31 was 2,380 students from 39 States (including the District of Columbia) and 16 foreign countries. At the June commencement 307 men and women received degrees in nine schools and colleges. Eight of these received the graduate degree of master of arts and master of science.

Outstanding events.

The outstanding events and procedures of the year 1930-31 were as follows: The addition of 63 new members to the teaching staff of the university as instructors and educational assistants; improvements in the classroom, laboratory, and office equipment of the undergraduate divisions of liberal arts, education, and music; the thorough renovation of the classrooms, office, and library of the school of law; a steady increase in the libraries of law, medicine, dentistry, and of the natural and social sciences of the undergraduate colleges, through gifts from the General Education Board and the Carnegie Foundation; the upward revision of entrance requirements in the colleges of medicine and law; the successful reorganization of the

faculty, curriculum, and entrance requirements of the school of law, its admittance to accredited rating by the American Bar Association, and its registration by the State of New York; the reorganization of and marked progress in the preclinical and clinical divisions of the school of medicine; the steady growth of graduate work; the corner-stone laying and practical completion of the new women's dormitories; the improvement and beautification of large portions of the grounds of the university, through a special grant of the Government for the relief of unemployment; a continuing of the policy of advancing competence in the teaching staff, through fellowships and sabbatical leave; the installation of new system in the office of the secretary-treasurer and the first-time establishment of a director of the budget; and the passing of the \$1,000,000 mark in physical plant extension, out of funds from private sources, increasing the total assets of the university to \$6,359,950.61 as compared with \$3,122,625.60 at the beginning of the present administration.

Increase in faculty personnel.

The outstanding creative factor of the year has been the additions to faculty personnel. The constructive effects of this movement are manifest throughout all the divisions of the university, except in the school of religion.

Undergraduate colleges.

In the undergraduate colleges all classes, with very few exceptions, have been reduced to reasonable size. Teaching loads have been reduced to an approximation of prevailing standards. Teachers are able, therefore, to organize their departmental work with due consideration for specialized abilities, to give their attention to the subjects of their choice, to organize presentation on a sounder basis, to add to the curriculum many greatly needed courses, to add qualitative content to the preparation of subject matter, to develop their original ideas in experimentation and research, and to bring forth a decided increase of published monographs and books. Throughout the undergraduate divisions also there is a marked increase of interest in individual students. Teachers also have made use of their newly acquired time and energy by taking increased interest in the voluntary activities of student life. As a result there has been a veritable revival of healthy student activities on the campus and a marked increase in student morale.

College of liberal arts.

Six hundred and seventy-three students enrolled in the college of liberal arts. Sixteen members were added to the faculty. This college carried 19 departments. Its faculty also carried two-thirds of the work in education, with a total of 783 students, and one-third

of the work of the college of applied science, with a total of 72 students. Eighty-two degrees were awarded, as follows: A. B., 34; B. S., 40; B. S. in commerce, 8.

College of education.

Seven hundred and eighty-three students enrolled in the college of education. Three full-time teachers were added to the faculty, making a total increase of 10 full-time teachers in this college within the 5-year period. This additional personnel has been a major creative factor in the college. The dean writes: "As a result of the increase in the faculty made for 1929-30 and 1930-31 the situation has been immeasurably improved." One hundred and six degrees were awarded, as follows: A. B. in education, 85; B. S. in education, 21.

College of applied science.

While the net enrollment in this college is listed as 72, there were 136 students, exclusive of the evening school, who registered for one or more courses. Five new teachers were added to the staff. A survey shows that all graduates of this college are gainfully employed in their special or allied fields. The department of architecture has collected and exhibited, for the first time in the United States, work of negroes in the field of architecture. The art gallery has had an average attendance of 50 observers per day. The department has two traveling exhibits of student art work. Mr. James L. Wells, an instructor in the department, has received the 1930 Harmon award for distinguished achievement in fine arts. Six degrees were conferred, as follows: B. S. in home economics, 1; B. S. in art, 2; B. S. in architecture, 1; B. S. in electrical engineering, 2.

School of music.

The school of music enrolled 120 students, the largest group in its history. Three new teachers were added to this faculty. All properties were renovated and two pianos were added to the equipment. Thirty students registered in the new junior division. A new and better department of violin is being developed and a trio ensemble and a new orchestra with a string section of 10 members have made their appearance. Five students received the degree of bachelor of music at commencement.

Graduate division.

One of the major constructive effects of the addition of new personnel to the faculties of liberal arts and education has been the increased impetus given to graduate work. During this year there were 80 graduates in residence, an increase of 28 over the graduate enrollment during the previous year. Eight graduate degrees were

awarded, as follows: M. A. in education, 2; M. A. in English, 2; M. A. in German, 1; M. A. in psychology, 1; M. S. in zoology, 2.

College of medicine.

The addition of new faculty personnel has accomplished steady and far-reaching improvements of instruction in the college of medicine. Six major appointments and many minor appointments were made during the current year. Among the new full-time appointments were the first of the younger men of superior training, now being prepared on fellowships for the preclinical branches. Five others are expected next year. The departments of anatomy, physiology, and pharmacology have been reorganized. New courses have been added and animal experimentation introduced. The leadership of the Negro Health Movement has been established in the department of bacteriology, preventive medicine, and public health. Increasingly effective relations are being established with Freedmen's Hospital. The department of bacteriology has now accepted responsibility for the special and routine bacteriological and immunological work of the hospital. The department of pathology has taken charge of the autopsy work of the hospital. Members of the clinical staff of Freedmen's Hospital have been made members of the faculty of the college of medicine. The department of medicine has placed a full-time resident in the hospital for the better organization of clinical material for teaching purposes. The department of obstetrics and gynecology has established a prenatal clinic. A city delivery service is also in operation. Accessions to the medical library increased by 110 per cent during the year, 214 volumes being received as donations and 3,094 by purchase from a grant by the General Education Board. There were 293 applications for admission. Sixty were admitted, after a more careful selection than ever before. Forty-one of these held bachelor's degrees. Of the 64 students graduating in June, 1930, 57 secured internships in approved hospitals. Fifty-four students received the degree of M. D. at the 1931 commencement.

College of dentistry.

Fifty-nine students enrolled in the college of dentistry. One full-time and two half-time teachers, a clinical record clerk, and a technician in prosthetic dentistry were added to the staff. Four hundred new and carefully selected volumes were received in the dental library, through a gift of \$2,000 from the Carnegie Corporation in New York City. Five thousand six hundred and ninety-one patients were served at the dental clinic during the autumn and winter quarters, an average of 271 per week. With a total of 29 in the senior and junior classes it will be readily seen that each of these

students is receiving a high ratio of clinical instruction. Application has been made to the Dental Educational Council of America for A class rating. A favorable ruling is expected. Twelve students received the degree of D. D. S. at commencement.

College of pharmacy.

Thirty-six students enrolled in pharmacy. A new full-time teacher was appointed as instructor in pharmacy. The curriculum was reorganized on a quarter basis. Decided improvements were made in the methods and substance of the classes in physiology and bacteriology. At commencement 13 students received the degree of Ph. C.

School of law.

Sixty-eight students attended this school. Twenty-eight new students were admitted to the freshman class, an increase of six over the previous year. Of these, 16 held college degrees. The physical plant was entirely renovated. New offices for instructors and new shelving for the library were provided. The work of the school of law was examined by the council of legal education and admittance to the bar of the American Bar Association, was found to maintain standards acceptable to that body, and was accredited by them. The school was also registered as satisfactorily meeting the requirements of the State of New York.

Summer school.

Four hundred and twenty-nine students from 28 States and 4 foreign countries attended the summer session of 1930. Twenty-three students met the requirements for graduation.

Library.

Two thousand nine hundred and seven volumes were added to the general library during the year, making a total of 53,013 volumes. Two hundred and fifty-eight of these volumes were received by gift and 2,652 by purchase.

Honorary degrees.

Four honorary degrees were awarded, as follows: M. A., 2; LL. D., 1; D. D., 1.

Finances and property.

Howard University was incorporated in 1867, but no appropriation was made for its support until March 3, 1879, when the sum of \$10,000 was appropriated for maintenance. Since that time Congress has made annual appropriations for the institution, expendable under the supervision of the Secretary of the Interior, who is patron ex officio of the board of trustees.

The report of the secretary-treasurer covers receipts from all sources, including the Federal appropriations, tuition and other fees, endowments and other investments, rent, donations, etc. The total income for 1931 from all sources was \$1,563,234.05, and the total expenditures were \$1,596,668.79. The total assets in June, 1931, were \$6,359,950.60. Of this amount \$1,063,367.91 represented assets in a physical plant extension fund made available from private sources; \$914,113.14 represented endowment funds; and \$4,093,702.59 represented the educational plant, including \$777,061.19 unexpended balance of appropriations from Congress for the new women's dormitories, chemistry, and classroom buildings. The balance consisted of \$262,785.57 assets of the general fund and \$25,981.40 assets of specific funds. The property of the university has been accumulated mainly through donations and the sale of, and the increase in value of, 128 acres of land originally purchased and subdivided by it.

COLUMBIA INSTITUTION FOR THE DEAF

SUMMARY OF THE PRESIDENT'S REPORT

During the fiscal year ended June 30, 1931, there were under instruction in the advanced department of the institution, known as Gallaudet College, 78 men and 54 women, a total of 132, representing 35 States, the District of Columbia, and Canada. In the primary department of the institution, known as the Kendall School, there were under instruction 41 boys, and 29 girls, a total of 70, 61 of whom were admitted as beneficiaries of the District of Columbia.

Good health prevailed throughout the year, although an unusual number of surgical cases were taken care of. All of these operations were successful. There were no contagious diseases at all among the college students, and almost none among the pupils of the Kendall School.

Courses in business practice for the girls of the college department and in architectural drawing for the boys of the college were put into operation with much success. Two young women of the college had the opportunity of studying photographic-negative retouching through the cooperation of one of the photographers of Washington. One of the boys of the Kendall School was also given the opportunity of learning machine shoe repairing.

On the 5th of February, 1931, the alumni of the college presented to the board of directors the sum of \$50,000 toward a memorial building to be erected in honor of Dr. Edward Miner Gallaudet. The presentation of the gift took place during a special convocation held in the chapel of the institution to celebrate the anniversary of the birthday of Doctor Gallaudet. The Secretary of the Interior, Hon. Ray Lyman Wilbur, delivered the address on this occasion, and Dr. Knight Dunlap, of Johns Hopkins University, was given the honorary degree of doctor of humane letters at the close of the convocation.

From a questionnaire sent out to the graduates and ex-students of the institution it was found that teaching and printing lead the list of occupations. From the replies to this questionnaire it was found that the average salary is \$150 per month. A large majority own their own homes, and over one-half of those replying own and drive their own cars.

The institution is greatly in need of a modern building for library, laboratory, and recitation purposes, and the gift of \$50,000 from the alumni of the college will be used toward the construction of such a building. The institution is also in need of extensive repairs to fences, light cables, etc., which have been postponed for the past few years for the sake of economy. The National Research Council, members of which have become very much interested in problems of the deaf, the Conference of Executives of American Schools for the Deaf, and the Convention of American Instructors of the Deaf all urge that a research department be established here at this institution in connection with the education and advancement of the education of the deaf.

A regular meeting of the Convention of American Instructors of the Deaf was held at Winnipeg, Canada, from June 22 to June 26. Sixty graduates of the normal and collegiate departments of the institution were present, as well as the president, Professor Fusfeld, and Mrs. Hazel Craig, all of the college faculty, and Mr. Sam Craig, principal of the Kendall School.

EXTRA-DEPARTMENTAL ACTIVITIES

AMERICAN ANTIQUITIES

SUMMARY OF THE CONSULTING ARCHEOLOGIST'S REPORT

The act of June 8, 1906, entitled "An act for the preservation of American antiquities," provides, among other things:

SEC. 3. That permits for the examination of ruins, the excavation of archeological sites, and the gathering of objects of antiquity upon the lands under their respective jurisdiction may be granted by the Secretaries of the Interior, Agriculture, and War to institutions which they may deem properly qualified to conduct such examination, excavation, or gathering, subject to such rules and regulations as they may prescribe: *Provided*, That the examinations excavations, and gatherings are undertaken for the benefit of reputable museums, universities, colleges, or other recognized scientific or educational institutions, with a view to increasing the knowledge of such objects, and that the gatherings shall be made for permanent preservation in public museums.

SEC. 4. That the Secretaries of the departments aforesaid shall make and publish from time to time uniform rules and regulations for the purpose of carrying out the provisions of this act.

Archeological explorations.

The uniform rules and regulations promulgated by the Secretaries of the Interior, Agriculture, and War, pursuant to the above-mentioned act, under date of December 28, 1906, provided (par. 3) that—

Permits for the excavation of ruins, the excavation of archeological sites, and the gathering of objects of antiquity will be granted by the respective Secretaries having jurisdiction to reputable museums, universities, colleges, or other recognized scientific or educational institutions, or to their duly authorized agents.

Under the provisions of the above act the department consulting archeologist, Mr. Jesse L. Nusbaum, who is also director of the laboratory of anthropology, Santa Fe, N. Mex., renders advisory service to all branches of the department, as well as to scientific and educational institutions contemplating archeological investigations upon the public domain under the jurisdiction of the department. This official is also engaged in developing means and methods for the better protection and preservation of the many archeological sites located mainly throughout the Southwest, the prevention of unlawful excavation of these sites, the orderly conduct of work authorized by department permits, and the proper publication of the scientific information derived therefrom.

Permits granted.

During the year 34 permits were granted for the examination, excavation, and gathering of archeological specimens. A complete list is published in the archeologist's report.

In submitting his report upon the work of the past year the department consulting archeologist states that since his headquarters have been maintained at the Laboratory of Anthropology it has been possible for him to cooperate more closely with the many field representatives of scientific institutions conducting archeological work in the Southwest area. As an evidence of the growing interest in archeological work he reports that there has been a considerable increase over the previous year in the number of institutions applying for permits and predicts that next year will witness an even greater activity in research work. It is pointed out, however, that with this growing interest, and the constant road improvement throughout the wilderness areas of a decade ago, many archeological ruins hitherto unexplored are being despoiled by the pot hunter, the curio seeker, and the vandal. In order to correct this condition he repeats in effect his recommendations of the previous year as follows:

That efforts be made to educate the public to a proper appreciation of the value of scientific investigations by qualified institutions as contrasted with the destructive work of the curio seeker and vandal; that all field employees, particularly in the Southwest, be made familiar with the "Act for the protection of American antiquities," and impressed with the importance of strictly enforcing this act and the prompt reporting to proper authorities of any violations thereof; That Government field heads be authorized to arrest persons who appropriate, excavate, injure or destroy prehistoric ruins or monuments on lands under the supervision of the department, and to seize any objects of antiquity unlawfully collected for deposit in the proper national depository; and Indian traders and others operating stores and trading posts on lands of the department under permit be prohibited from purchasing, bartering, or exposing for sale archeological materials or objects of antiquity under penalty of revocation of license.

GENERAL EDUCATION BOARD

SUMMARY OF THE CORPORATION'S REPORT

This corporation was created by an act of Congress approved January 12, 1903, section 6 of which requires the corporation to file annually with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation, and the expenditure or other use or disposition of the same or the income thereof during the preceding year. It has for its object the promotion of education within the United States.

On June 30, 1931, the principal funds, belonging without restriction to the board, amounted to \$49,792,285.28. This is invested in stocks and bonds. In addition the sum of \$18,964,843.15 is reserved to pay appropriations to various educational institutions, including \$5,150,000 appropriated during the year ended June 30, 1931. This fund is also invested in stocks and bonds. As prior years' appropriations in the sum of \$1,210,636.41 were lapsed during the year, the net increase in appropriations from principal was \$3,939,363.59. The sum of \$11,723,226.31 was paid during the year ended June 30, 1931.

Appropriations from income during the year aggregated \$4,012,722.95. Lapses on account of prior years' appropriations amounted to \$945,905.30, however, leaving a net increase in income appropriations of \$3,066,817.65.

The income from the above funds, together with the income from undisbursed income, amounted during the year to \$4,251,783.51. The balance of income from the previous year as of June 30, 1930, amounting to \$13,032,232.87, together with sundry refunds amounting to \$5,890.14, increased the total to \$17,289,906.52.

Disbursements from income during the year were as follows:

Whites:

Colleges of liberal arts, general endowment, buildings and other purposes-----		\$498,981. 18
Science of education—		
Schools of education-----	\$80, 720. 75	
Special projects-----	113, 472. 87	
		194, 193. 62
Natural Sciences-----		68, 766. 51
Medical sciences—		
Schools of medicine-----	560, 351. 01	
Special projects-----	21, 393. 50	
		581, 744. 51

Whites—Continued.

Humanities-----	\$337, 943. 15
Industrial art-----	20, 144. 90
Public education—	
Fellowships-----	\$35, 767. 00
Special divisions in State departments of education-----	130, 432. 96
Teacher training-----	167, 934. 06
Library training-----	28, 603. 44
Studies-----	23, 323. 08
Other purposes-----	978. 30
	<hr/> 387, 038. 84
	<hr/> 2, 088, 812. 71

Negroes:

Colleges and Schools—

General endowment, buildings and other purposes-----	1, 533, 118. 91
Natural sciences-----	6, 500. 00
Medical sciences, schools of medicine-----	151, 931. 55
Public education—	
Summer schools-----	10, 479. 60
Anna T. Jeanes Foundation-----	76, 300. 00
John F. Slater fund-----	68, 450. 00
Rural school agents-----	130, 071. 68
Fellowships-----	51, 300. 00
Teacher training-----	8, 000. 00
Other purposes-----	9, 159. 41
	<hr/> 353, 760. 69
	<hr/> 2, 045, 311. 15

Surveys and studies-----	26. 00
Miscellaneous projects-----	8, 275. 72
Administration-----	276, 840. 71

Total disbursements from income----- 4, 419, 266. 29

This leaves an undisbursed balance of income on June 30, 1931, of \$12,870,640.23, which is invested as follows: Securities, \$8,723,704.17; cash on deposit, \$370,864.67; certificate of deposit, \$3,000,000; accounts receivable, net, \$776,071.39. It should be noted, however, that against this balance there are unpaid appropriations amounting to \$11,890,832.78, leaving unappropriated income amounting to \$979,807.45.

The Anna T. Jeanes fund, the income of which is to be used for negro rural schools, amounts to \$206,084.16. It is invested as follows: Bonds, \$109,289.16; stocks, \$16,645; cash on deposit, \$80,150. The income from this fund during the year was \$9,068.76. Added to the balance from the previous year, the total available income amounted to \$15,500.22. Of this, \$10,752.40 was appropriated and paid to various schools, leaving a balance of \$4,747.82 accounted for in cash on deposit.

FUEL ADMINISTRATION AND BITUMINOUS COAL COMMISSION RECORDS

The records of the Fuel Administration and the Bituminous Coal Commission were transferred to the custody of the Secretary of the Interior under Executive orders of July 22, 1919, March 24, 1920, and June 16, 1920, and numerous requests for information therefrom and for certified copies of such records have been received. Under date of June 27, 1928, a committee was designated by the Secretary of the Interior to make careful examination of the records and files of the Fuel Administration with a view to submitting the report to Congress to determine whether any of the same could be destroyed. The report of this committee which was submitted to Congress February 13, 1929, under the act of February 16, 1889 (25 Stat. 672), recommended that a very large number of the Fuel Administration records be destroyed as having no permanent value nor being of historical interest, and recommended that the files of the Bituminous Coal Commission be kept intact. This recommendation, following approval by Congress on March 30, 1930, was followed.

THE PERRY'S VICTORY MEMORIAL COMMISSION

SUMMARY OF THE COMMISSION'S REPORT

The officers of the commission remained the same as during the previous year, namely: President, Webster P. Huntington, Columbus, Ohio; vice president, Charles B. Perry, Milwaukee, Wis.; secretary, Richard S. Folsom, Chicago, Ill.; treasurer, William Schnoor, Put in Bay, Ohio; auditor, Harry E. Davis, Woonsocket, R. I.

The report described the physical condition of the memorial property, referring to the granite Doric column 352 feet in height, the plazas and approaches, and grounds of 14 acres as "entirely satisfactory," with the further comment: "The memorial has been open to the public 15 years, though during 10 years of that time in an uncompleted state, and we can conceive of no public work of like character having required less diligence and expense for repairs and upkeep."

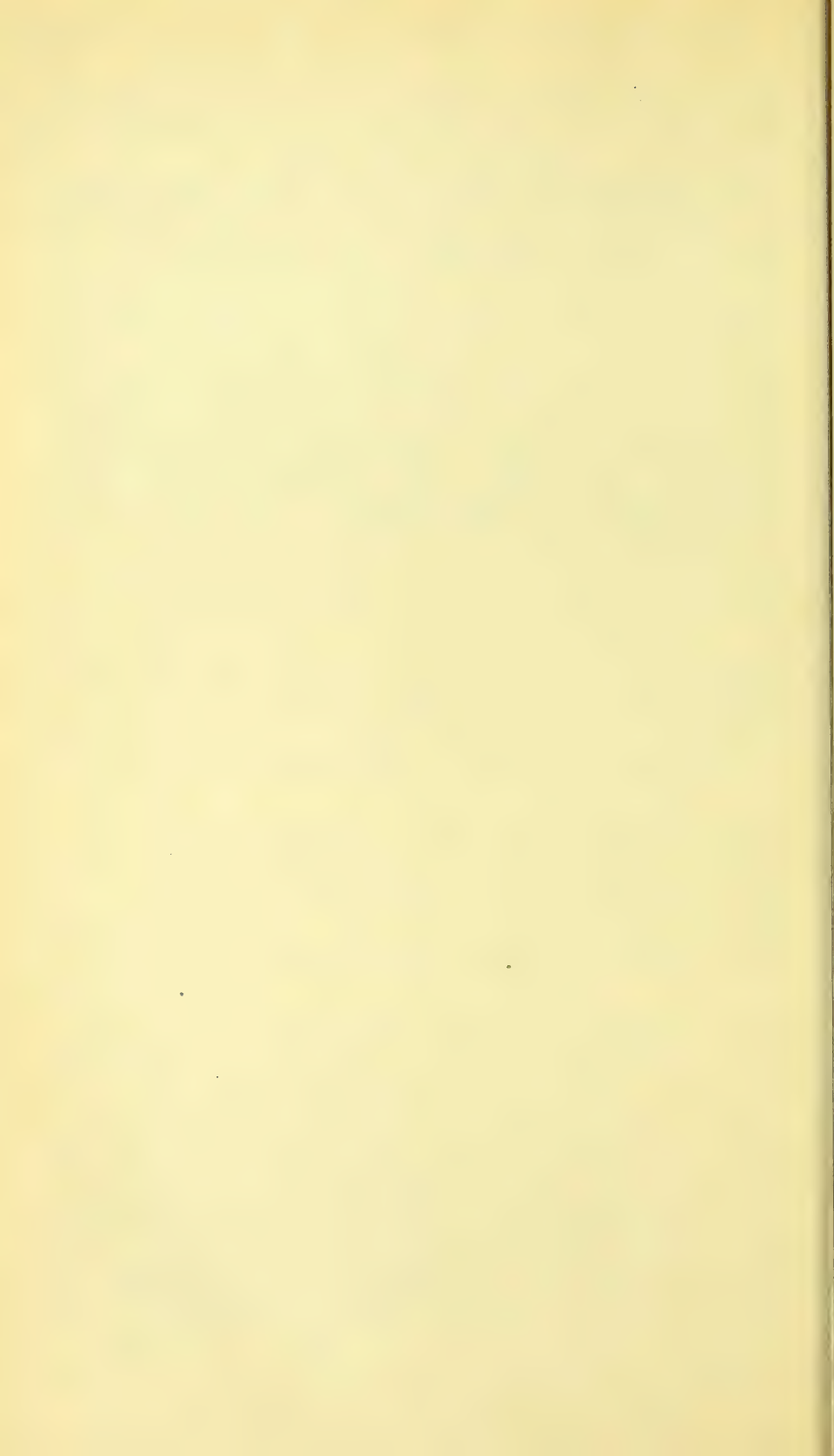
The commission urges that Congress supply the means to replace the shore retaining wall and reconstruct the road which it was designed to protect. Such protection, it is urged, "would be no more than another step looking to completion of the memorial's construction."

"The commission is not able," says the report, "and never will be able, from its revenues from operation, to light the Doric column for navigation and aviation purposes nightly during the necessary hours when such lighting would afford the safety desirable for both navigation and aviation." Therefore, it is urged that these interests "would be most beneficially promoted by Government aid in maintaining the light."

At the annual meeting of the commission in 1930, measures were suggested looking to the erection, if possible, during the season of 1931, of four historical bronze tablets in the rotunda of the memorial, one commemorating the treaty of 1817 between Great Britain and the United States, commonly called the Rush-Bagot agreement, providing for naval disarmament on the Great Lakes; one written by President Woodrow Wilson and deposited in the corner stone of the memorial in 1913; one written by President William H. Taft, also for the corner stone; and one written by Henry Watterson, then vice president of the commission, in 1917. In a supplementary report for the period of operation to September 1, 1931, the commis-

sion now states that this purpose has been achieved, but that the details will be reserved for its annual report to the Secretary of the Interior for the year ending December 1, 1931.

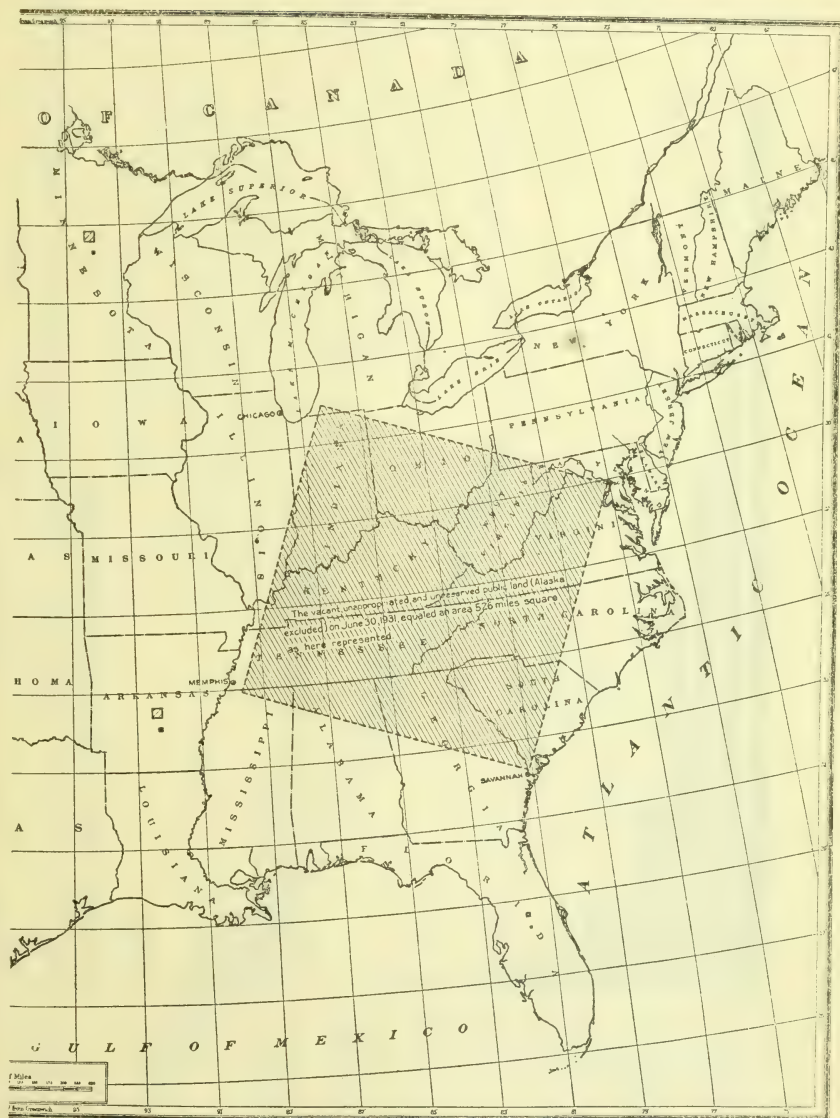
The operation of the memorial during the year ending December 1, 1930, resulted in the smallest financial returns since 1915, when it was first opened to the public, the gross receipts falling short \$2,295.34 as compared with those of the previous season, notwithstanding there was a reduction of \$1,884.15 in expenses as compared with the previous year. The total receipts were \$5,533.90, and the expenses \$6,219.51, causing an apparent deficit of \$685.61. However, of the latter sum, \$252.38 was expended as the premium on fire and tornado insurance for the new utility building and souvenir stand for a period of three years, so that the actual deficit from operation on the basis of former years was \$433.23. The cash balance on hand December 1, 1929, having been \$1,253.63, the cash balance remaining December 1, 1930, was \$568.02.



CHARTS



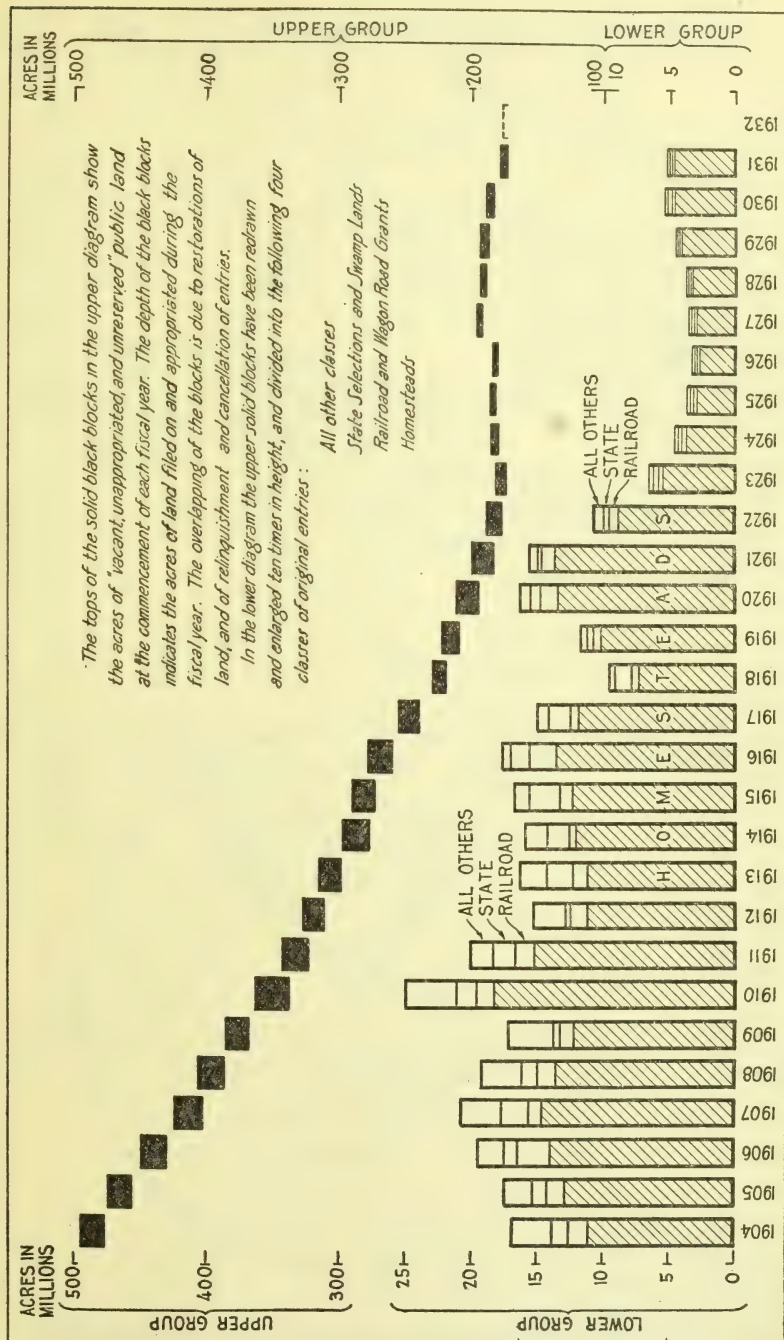
COMPARATIVE AREAS OF VACANT UNAPPROPRIATED PUBLIC LANDS (SHADED)



THE TOTAL AREA OF VACANT PUBLIC LANDS SUPERIMPOSED ON A MAP OF THE STATES EAST OF THE MISSISSIPPI

DISPOSALS	ACRES
ORAL SALES	307,294,653
HOMESTEADS	234,990,474
STATE AND GRAZP LANDS	131,558,943
RAILROAD LANDS AND SIMILAR	142,424,312
BOUNTY LAND WARRANTS	64,002,424
PRIVATE LAND CLAIMS	34,784,916
INDIAN ALLOTMENTS	27,214,793
TIMBER & STONE	13,844,369
DESERT	9,859,738
TIMBER CULTURE	9,856,501
MISCELLANEOUS 1905-1931	4,186,119
MINERAL	3,134,041
SCRIP	1,625,775
CAREY ACT (PATENTED)	1,174,903
COAL	604,443
	1,036,557,194
WITHDRAWALS & RESERVATIONS	
NATIONAL FORESTS (NET)	136,555,654
INDIAN RESERVATIONS	70,993,326
MISCELLANEOUS	22,237,569
FED. RECLAMATION PROJECTS	19,034,330
NAT'L PARKS AND MONUMENTS	6,535,690
	255,356,769
PENDING ENTRIES	24,241,042
VACANT, UNAPPROPRIATED, AND UNRESERVED:	
U. S. PROPER	177,101,551
ALASKA	376,165,760
GRAND TOTAL	1,871,422,316

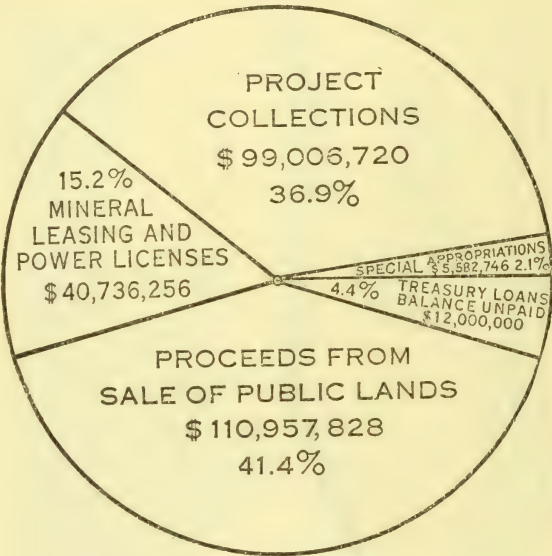
SUMMARY OF APPROXIMATE DISPOSITION OF PUBLIC DOMAIN, 1787-1931



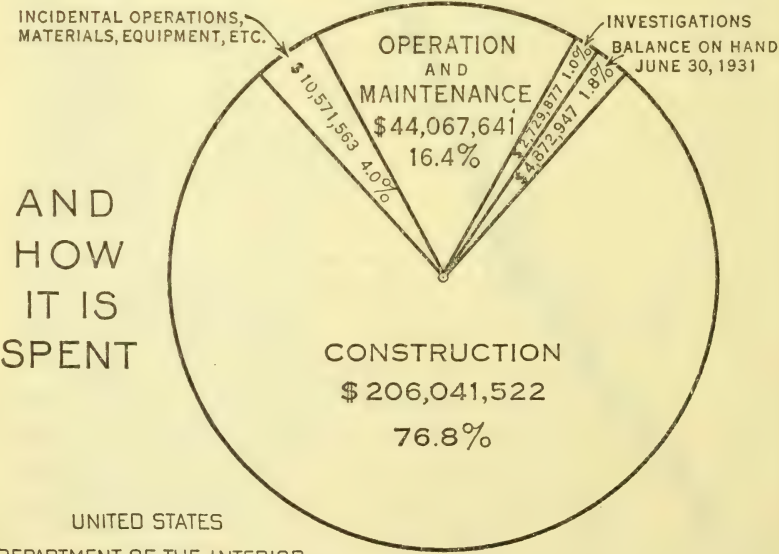
AREA OF VACANT PUBLIC LAND AND MANNER OF DISPOSITION BY YEARS, 1904-1931

THE RECLAMATION DOLLAR

JUNE 30, 1931



WHERE
IT COMES
FROM



AND
HOW
IT IS
SPENT

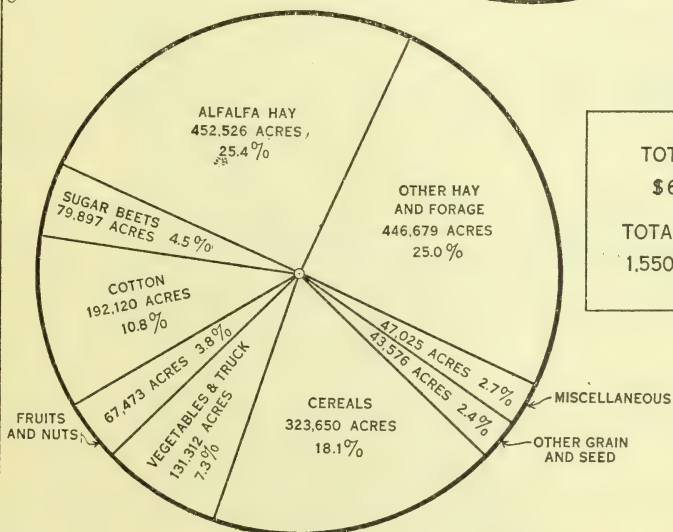
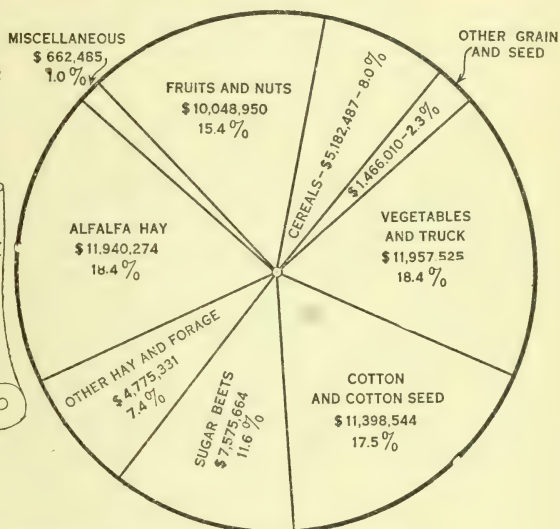
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

No. 24323

FEDERAL IRRIGATION PROJECTS

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

VALUE AND ACREAGE
OF
IRRIGATED CROPS
1930

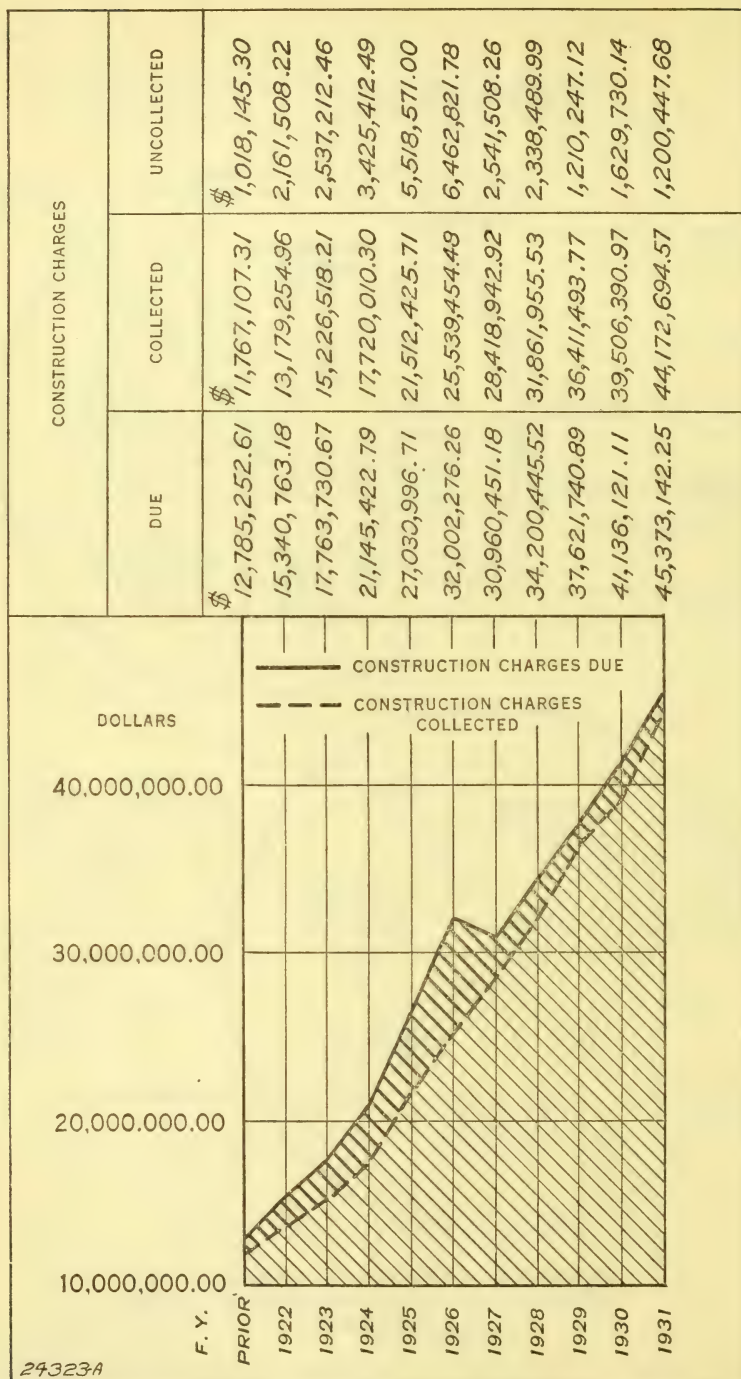


TOTAL VALUE
\$65,007,270
TOTAL ACREAGE
1,550,967 ACRES

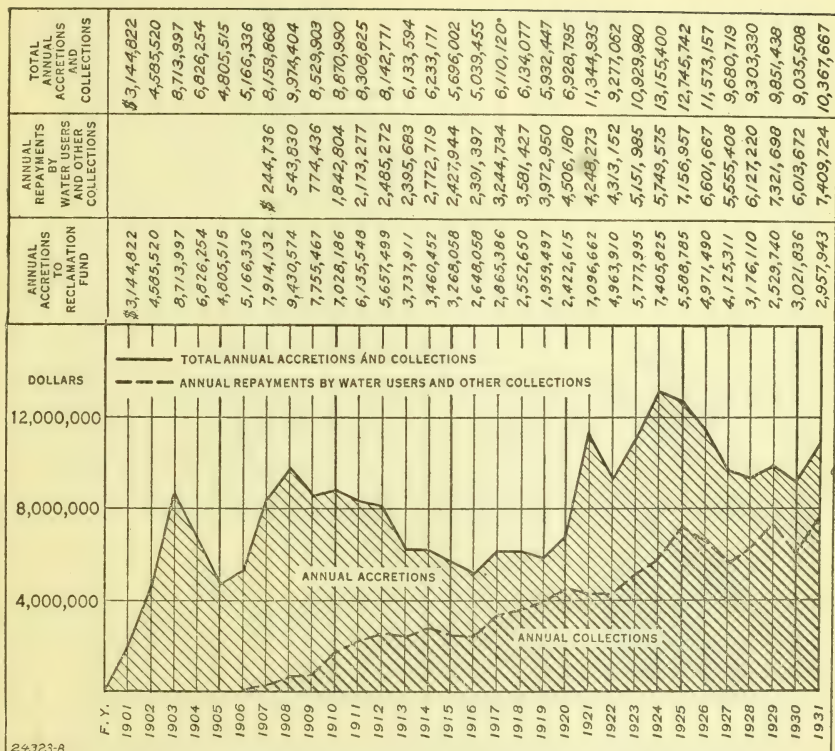
ADDITIONAL LAND, 1,254,493 ACRES, RECEIVING PROJECT WATER
UNDER WARREN ACT CONTRACTS, PRODUCED CROPS VALUED AT
\$54,654,550

No. 24322

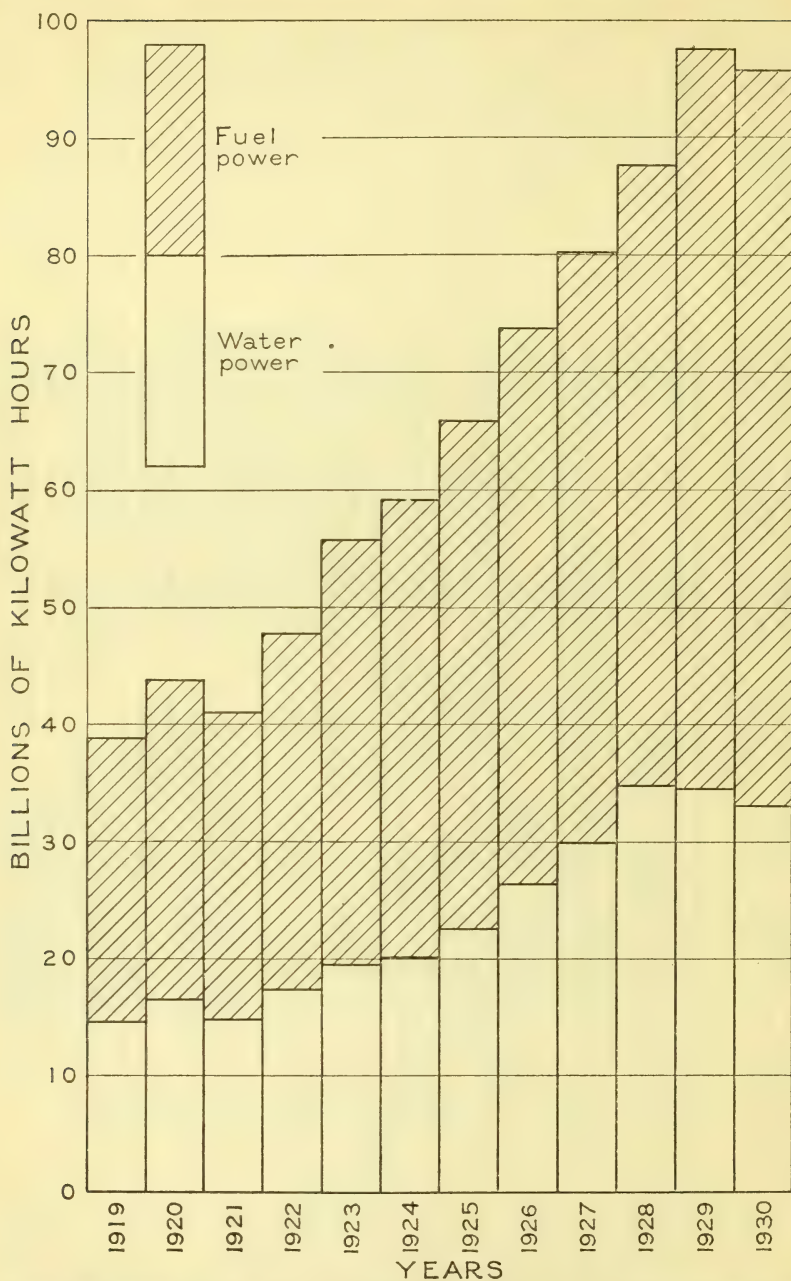
VALUE AND AVERAGE OF CROPS ON FEDERAL RECLAMATION PROJECTS, 1930



CONSTRUCTION CHARGES DUE, COLLECTED, AND UNCOLLECTED, CUMULATED ANNUALLY DURING THE PERIOD 1921-1931

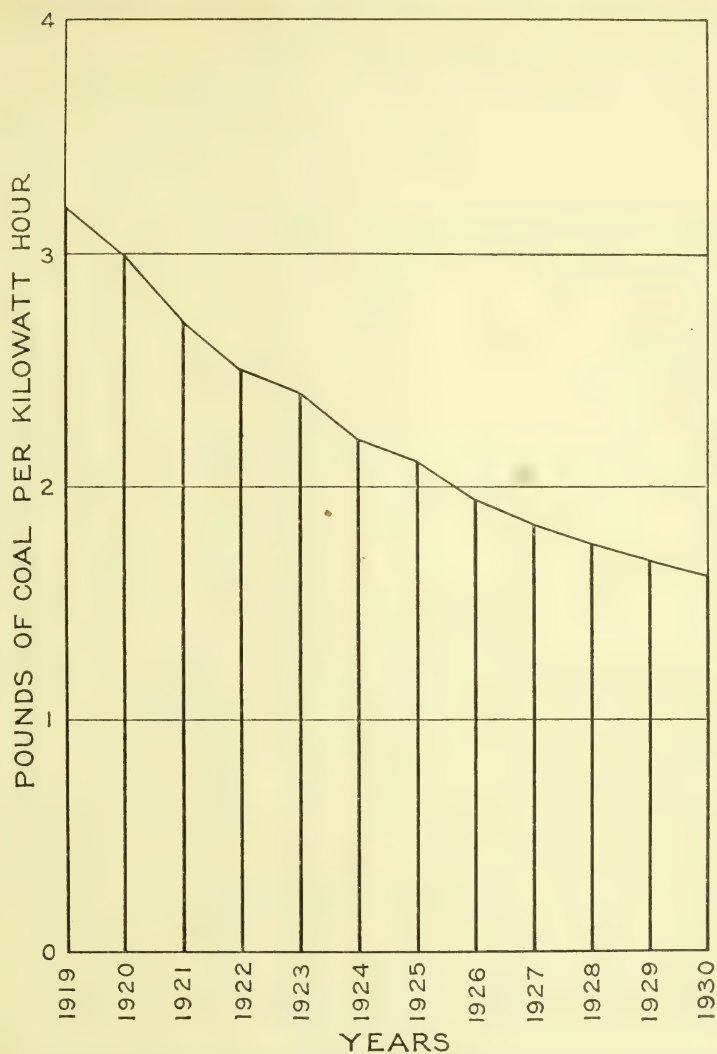


ANNUAL ACCRETIONS TO THE RECLAMATION FUND, 1901-1931

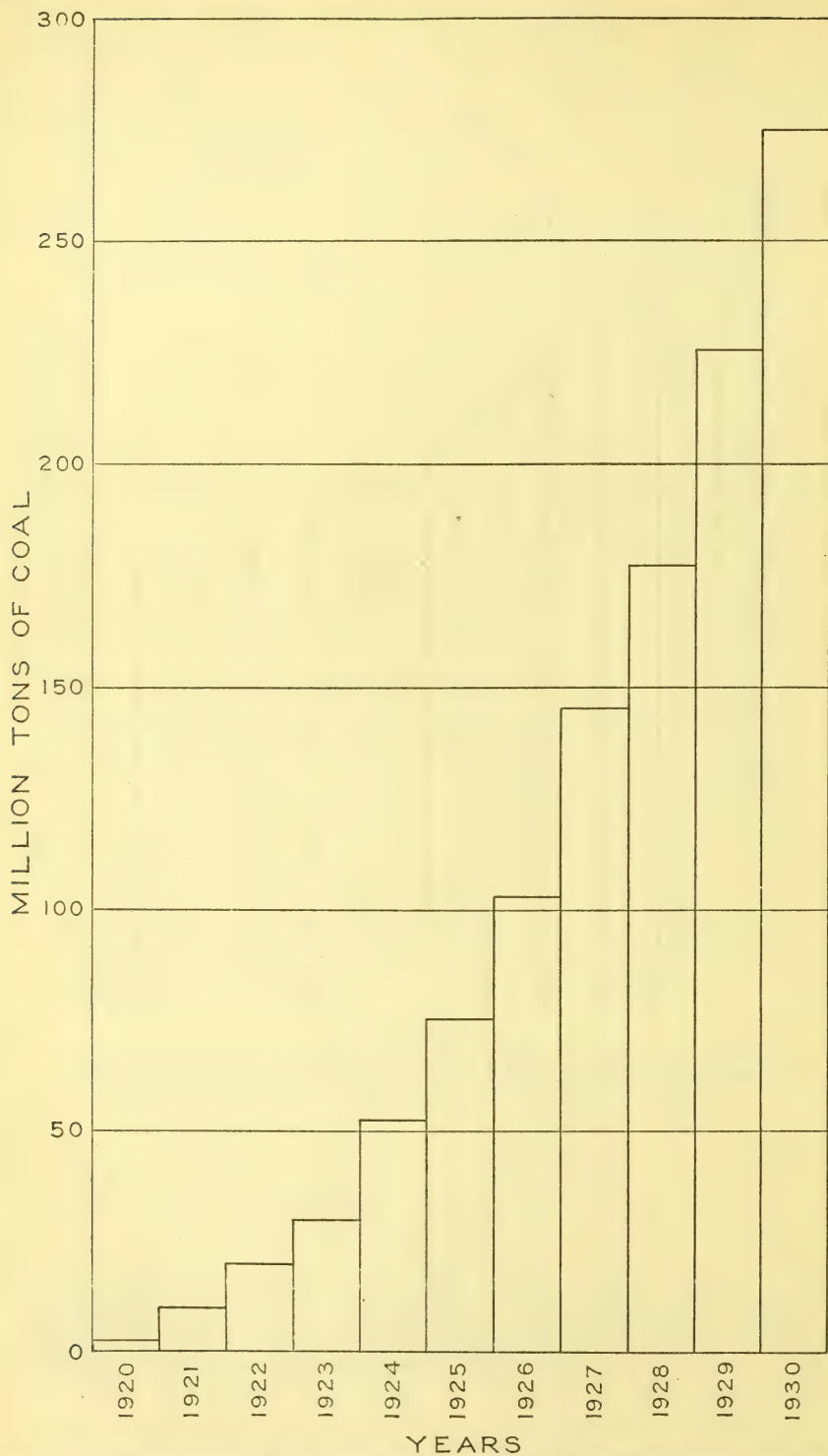


Annual production of electricity by electric public-utility power plants for public use

Includes output of central stations, both commercial and municipal, electric railway plants, plants operated by steam railroads generating electricity for traction, Bureau of Reclamation plants, and public-works plants, and that part of the electricity produced by manufacturing plants which is sold.

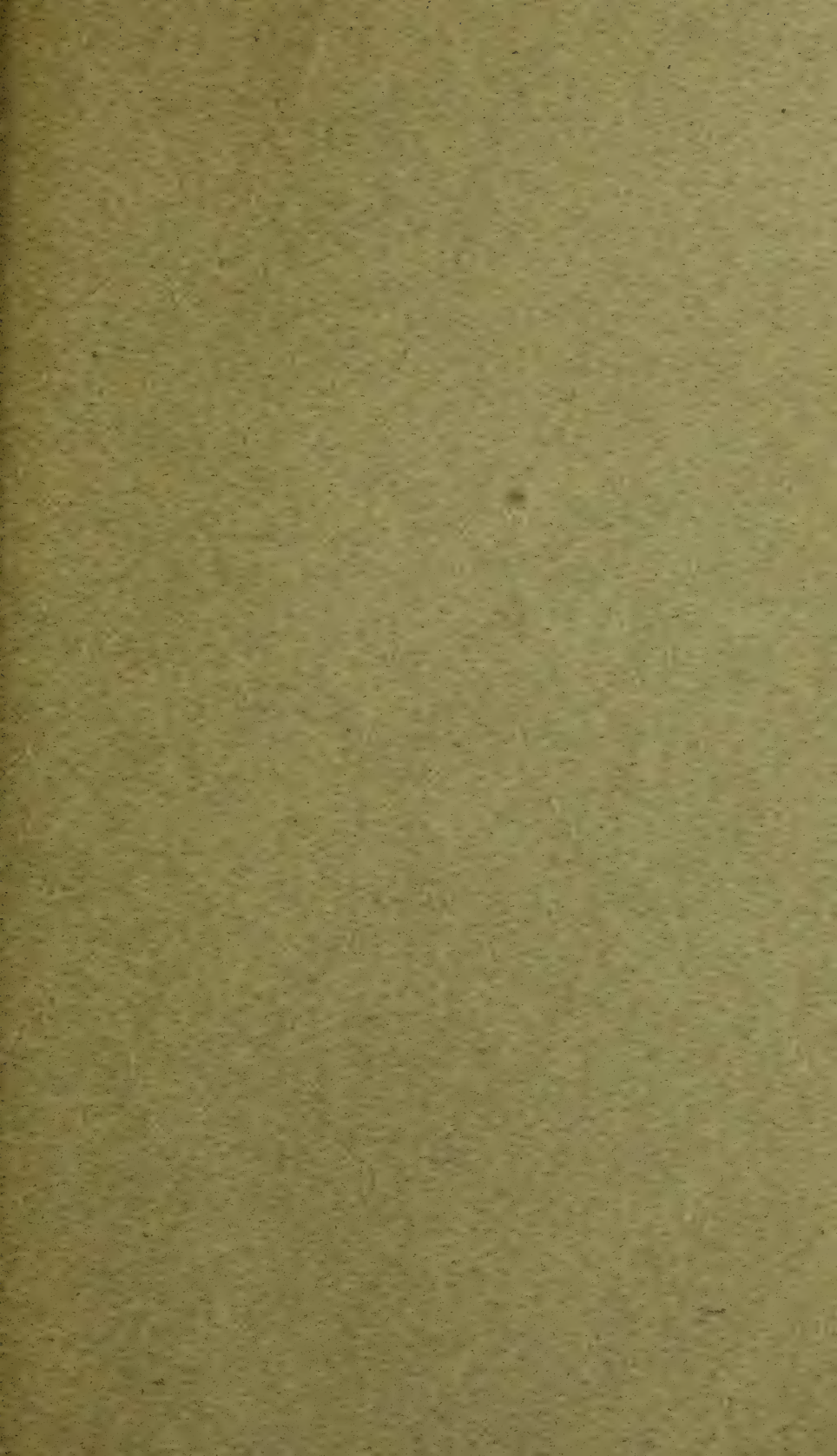


Consumption of coal and coal equivalent of oil and gas in generating 1 kilowatt-hour of electricity at electric public-utility plants, 1919-1930



Accumulated conservation of coal and coal equivalent of oil and gas brought about by improvement in utilization of fuels by electric public utilities since 1919

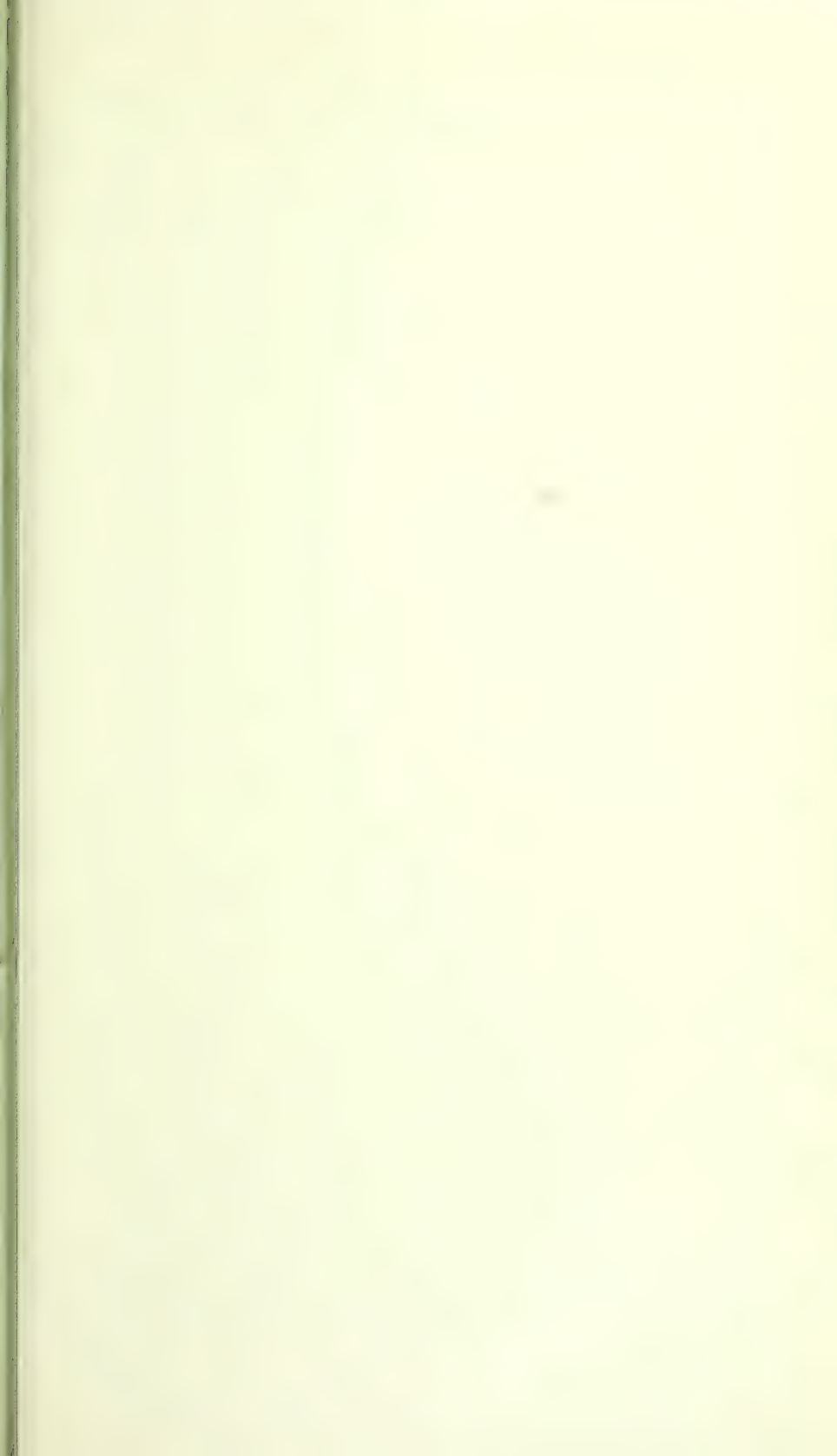


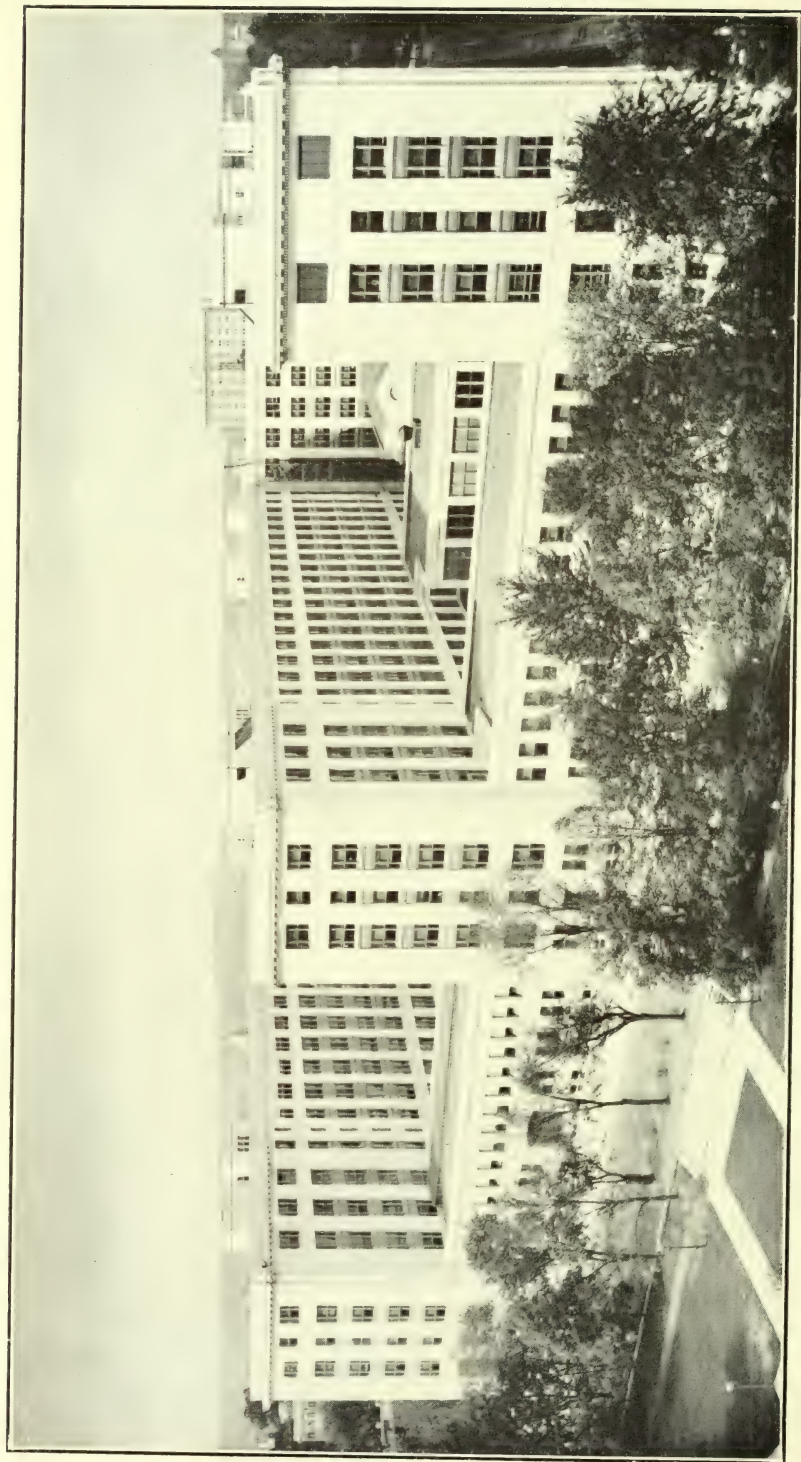


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ANNUAL REPORT
of the SECRETARY
OF THE INTERIOR
for the FISCAL YEAR ENDED **1932**
JUNE 30 ~ ~ ~ ~ ~





INTERIOR DEPARTMENT BUILDING

ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR



FOR THE FISCAL YEAR ENDED JUNE 30, 1932



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932



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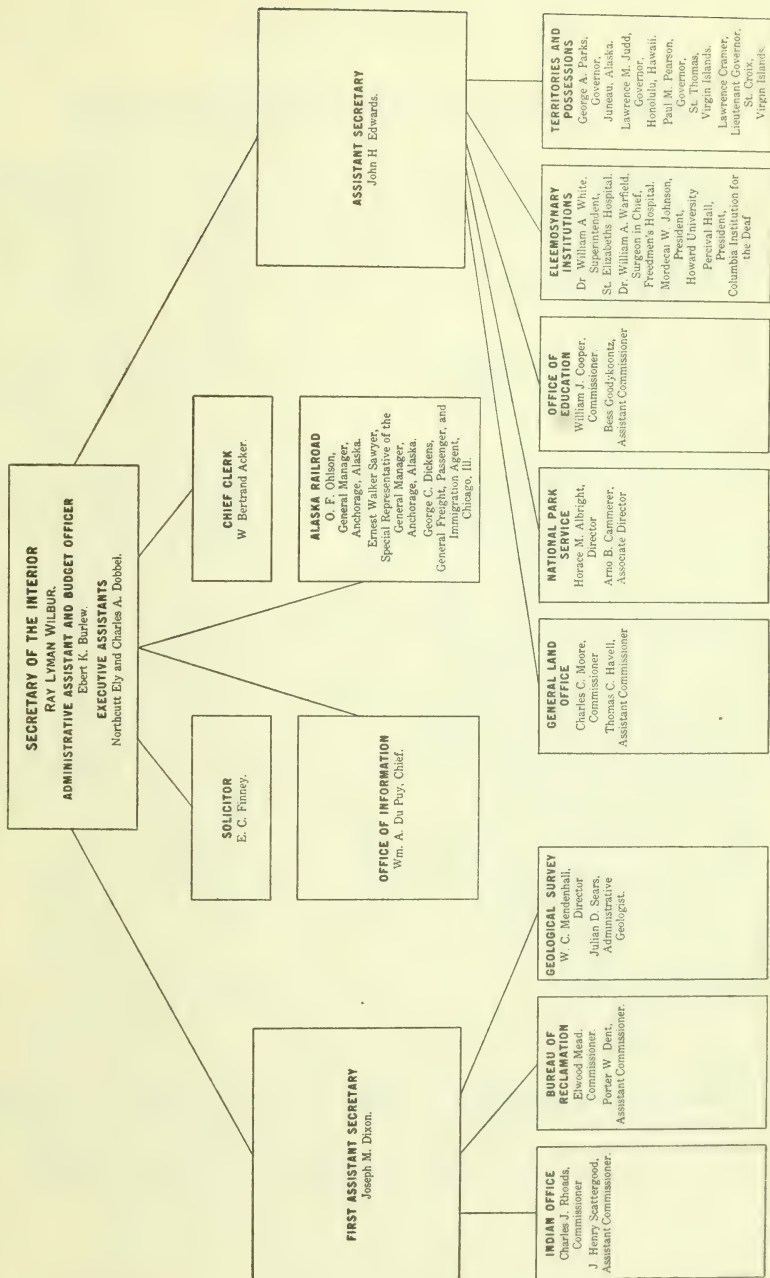
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DEPARTMENT OF THE INTERIOR



ORGANIZATION CHART

OFFICERS OF DEPARTMENT OF THE INTERIOR

Office of the Secretary:

<i>Secretary of the Interior</i> -----	RAY LYMAN WILBUR.
<i>First Assistant Secretary</i> -----	JOSEPH M. DIXON.
<i>Assistant Secretary</i> -----	JOHN H. EDWARDS.
<i>Administrative Assistant</i> -----	EBERT K. BURLEW.
<i>Executive Assistant</i> -----	CHAS. A. DOBBEL.
<i>Executive Assistant</i> -----	NORTHCUTT ELY.
<i>Assistant Administrative Officer</i> -----	GEORGE E. SCOTT.
<i>Chief Clerk of the Department</i> -----	WM. BERTRAND ACKER.

Office of the Solicitor:

<i>Solicitor</i> -----	EDWARD C. FINNEY.
<i>Assistant to the Solicitor</i> -----	ORLIN H. GRAVES.
<i>Member, Board of Appeals</i> -----	ALVAH W. PATTERSON.
<i>Member, Board of Appeals</i> -----	JOHN P. McDOWELL.
<i>Member, Board of Appeals</i> -----	JOHN H. THOMAS.

The Bureaus:

<i>Commissioner of the General Land Office</i> -----	CHARLES C. MOORE.
<i>Assistant Commissioner, General Land Office</i> ---	THOMAS C. HAVELL.
<i>Commissioner of Indian Affairs</i> -----	CHARLES J. RHOADS.
<i>Assistant Commissioner of Indian Affairs</i> -----	J. HENRY SCATTERGOOD.
<i>Commissioner of Education</i> -----	WM. JOHN COOPER.
<i>Assistant Commissioner of Education</i> -----	MISS BESS GOODYKOONTZ.
<i>Director of the Geological Survey</i> -----	WALTER C. MENDENHALL.
<i>Administrative Geologist</i> -----	J. D. SEARS.
<i>Commissioner of Reclamation</i> -----	ELWOOD MEAD.
<i>Assistant Commissioner of Reclamation</i> -----	PORTER W. DENT.
<i>Director of the National Park Service</i> -----	HORACE M. ALBRIGHT.
<i>Associate Director, National Park Service</i> -----	ARNO B. CAMMERER.

The Territories and Possessions:

<i>Governor of Hawaii</i> -----	LAWRENCE M. JUDD.
<i>Governor of Alaska</i> -----	GEORGE A. PARKS.
<i>Governor of the Virgin Islands</i> -----	PAUL M. PEARSON.
<i>General Manager, the Alaska Railroad</i> -----	OTTO F. OHLSON.

Institutions:

<i>Superintendent, St. Elizabeths Hospital</i> -----	DR. WILLIAM A. WHITE.
<i>Surgeon-in-chief, Freedmen's Hospital</i> -----	DR. WILLIAM A. WARFIELD
<i>President, Howard University</i> -----	MORDECAI W. JOHNSON.
<i>President, Columbia Institution for the Deaf</i> ---	DR. PERCIVAL HALL.

FUNCTIONS OF THE DEPARTMENT OF THE INTERIOR

The United States Department of the Interior, established by the act of March 3, 1849 (9 Stat. 395), is the land, home, and education department of the Government. Its work is a permanent contribution to the educational scientific, historical, and conservation functions of the Government. It is a fact-finding department for internal development. Its mission is largely educational and many of its activities are devoted to the discovery and dissemination of knowledge.

GENERAL LAND OFFICE.—Originally organized as a bureau of the Treasury Department under the act of April 25, 1812 (2 Stat. 716), and transferred to the Interior Department in 1849, the General Land Office has control of the public lands, including their survey, handling applications for homesteads and Indian allotments, desert land and mining claims, and mineral leases. Has jurisdiction over granting railroad and other rights of way and easements on public lands and adjusting State and railroad land grants.

OFFICE OF INDIAN AFFAIRS.—Originally organized as a bureau of the War Department under the act of July 9, 1832 (4 Stat. 564), and transferred to the Interior Department in 1849. Acts as the official guardian of the Indians; promotes their health and physical welfare; directs the education of Indian children; encourages their native arts and crafts; reclaims their lands and develops the national resources in timber and minerals; supervises their funds; adjusts heirship matters and handles all Indian affairs of the Government.

OFFICE OF EDUCATION.—Established as a department under the act of March 2, 1867 (14 Stat. 434), and became a bureau of the Interior Department in 1869 (15 Stat. 106). Further education by the compilation and dissemination of data covering education in the United States and foreign countries; conducts university, college, and school surveys, including experiments in education; operates Government schools for the natives of Alaska.

GEOLOGICAL SURVEY.—Established under the act of March 3, 1879 (20 Stat. 394). Makes topographic and geological maps of the United States and Alaska; studies the surface and underground water resources; prepares and distributes reports on gold, silver, petroleum, and other mineral deposits; and, through a conservation branch, classifies public lands and supervises engineering phases of mineral leasing.

BUREAU OF RECLAMATION.—Established under the act of June 17, 1902 (32 Stat. 388), for the purpose of developing agricultural possibilities of the arid and semiarid regions of the United States. This bureau constructs and operates irrigation works; collects annual payments from water users for cost of irrigation; promotes knowledge of irrigation methods, suitability of crops, availability of markets, and improvement of farm homes.

NATIONAL PARK SERVICE.—Established by the act of August 25, 1916 (39 Stat. 535), this bureau conserves the natural beauties and unique characteristics of the national parks and monuments under its control and promotes their use for the health and recreation of the people. It also protects and restores ruins of ancient civilization and the flora and fauna of the parks.

ALASKA RAILROAD.—Construction authorized by Congress under the act of March 12, 1914 (38 Stat. 305), and completed in 1923 at a cost of \$60,000,000. This Government owned and operated road extends for a distance of 467 miles into the interior of Alaska, transporting passengers, freight, express, and mail.

ALASKA ROAD COMMISSION.—The act of Congress approved June 30, 1932, provided that the duties authorized and the authority conferred by law upon the Board of Road Commissioners in the Territory of Alaska and upon the Secretary of War, as provided for in the act of January 27, 1905 (33 Stat. 616), as amended by the act of May 14, 1906 (34 Stat. 192), and acts supplemental thereto and amendatory thereof, be transferred to the Department of the Interior and thereafter to be administered by the Secretary of the Interior or under his direction by such officer or officers as might be designated by him. Pursuant to such authority the Secretary of the Interior by order dated June 30, 1932, directed that the duties heretofore exercised by the Board of Road Commissioners shall be administered by the ex-officio commissioner for Alaska representing the Interior Department subject to the general supervision of the Secretary of the Interior. The ex-officio commissioner referred to is the Hon. George A. Parks, Governor of Alaska.

ST. ELIZABETHS HOSPITAL.—Established under the act of March 3, 1855 (10 Stat. 682), this is a class A institution for the treatment of mental diseases of the Army, Navy, and District of Columbia.

FREEDMEN'S HOSPITAL.—Established under the control of the War Department by act of March 3, 1871 (16 Stat. 506), and transferred to Interior Department by act of June 23, 1874 (18 Stat. 223). This hospital provides medical and surgical treatment for the colored race, its patients including indigent residents of the District of Columbia, residents of the several States, emergency cases, and regular pay patients.

HOWARD UNIVERSITY.—Established by the act of March 2, 1867 (14 Stat. 438), this is an institution of higher education of the colored youth of the Nation in liberal arts and sciences, medicine, law, and religion.¹

COLUMBIA INSTITUTION FOR THE DEAF.—Established under the act of February 16, 1857 (11 Stat. 161). This institution cares for deaf-mutes of the States and Territories and the District of Columbia. It reports annually to the Secretary of the Interior and certain of its beneficiaries are admitted to the institution under that officer.

The territories of Alaska and Hawaii are directly represented by the Secretary of the Interior in the official family of the President, in the various Federal activities in these Territories under his supervision.

The government of the Virgin Islands was by Executive order dated February 27, 1931, placed under the supervision of the Secretary of the Interior.

¹ Amended by the act of December 13, 1928 (45 Stat. 1029), so as to authorize appropriations by Congress and providing for the institution being opened to inspection by the Bureau of Education.

SERVICE OF SECRETARIES OF THE INTERIOR

Name	When appointed	Whence appointed	President	Length of service
				<i>Yrs. mos. days</i>
1. Thomas Ewing.....	Mar. 8, 1849	Ohio.....	Taylor and Fillmore.....	1 5 8
2. Thomas M. T. McKennan.....	Aug. 15, 1850	Pennsylvania.....	Fillmore.....	0 0 27
3. Alexander H. H. Stuart.....	Sept. 12, 1850	Virginia.....	do.....	2 5 25
4. Robert McClelland.....	Mar. 7, 1853	Michigan.....	Pierce.....	4 0 0
5. Jacob Thompson.....	Mar. 6, 1857	Mississippi.....	Buchanan.....	4 0 0
6. Caleb B. Smith.....	Mar. 5, 1861	Indiana.....	Lincoln.....	1 10 4
7. John P. Usher.....	Jan. 8, 1863	do.....	Lincoln and Johnson.....	2 4 7
8. James Harlan.....	May 15, 1865	Iowa.....	Johnson.....	1 2 12
9. Orville H. Browning.....	July 27, 1866	Illinois.....	do.....	2 7 10
10. Jacob B. Cox.....	Mar. 5, 1869	Ohio.....	Grant.....	1 7 27
11. Columbus Delano.....	Nov. 1, 1870	do.....	do.....	4 11 19
12. Zachariah Chandler.....	Oct. 19, 1875	Michigan.....	do.....	1 4 25
13. Carl Schurz.....	Mar. 12, 1877	Missouri.....	Hayes.....	3 11 24
14. Samuel J. Kirkwood.....	Mar. 5, 1881	Iowa.....	Garfield and Arthur.....	1 1 2
15. Henry M. Teller.....	Apr. 17, 1882	Colorado.....	Arthur.....	2 11 0
16. Lucius Q. C. Lamar.....	Mar. 6, 1885	Mississippi.....	Cleveland.....	2 10 10
17. William F. Vilas.....	Jan. 16, 1888	Wisconsin.....	do.....	1 1 22
18. John W. Noble.....	Mar. 6, 1889	Missouri.....	Harrison.....	4 0 0
19. Hoke Smith.....	Mar. 6, 1893	Georgia.....	Cleveland.....	3 5 25
20. David R. Francis.....	Sept. 1, 1896	Missouri.....	do.....	0 6 5
21. Cornelius N. Bliss.....	Mar. 5, 1897	New York.....	McKinley.....	1 11 15
22. Ethan Allen Hitchcock.....	Dec. 21, 1898	Missouri.....	McKinley and Roosevelt.....	8 0 13
23. James R. Garfield.....	Jan. 15, 1907 ¹	Ohio.....	Roosevelt.....	2 0 0
24. Richard A. Ballinger.....	Mar. 5, 1909	Washington.....	Taft.....	2 0 5
25. Walter L. Fisher.....	Mar. 7, 1911	Illinois.....	do.....	1 11 26
26. Franklin K. Lane.....	Mar. 6, 1913	California.....	Wilson.....	6 11 26
27. John Barton Payne.....	Feb. 28, 1920 ²	Illinois.....	do.....	0 11 20
28. Albert B. Fall.....	Mar. 5, 1921 ³	New Mexico.....	Harding.....	2 0 0
29. Hubert Work.....	Mar. 5, 1923 ⁴	Colorado.....	Harding and Coolidge.....	5 4 19
30. Roy O. West.....	July 20, 1928	Illinois.....	Coolidge.....	0 7 10
31. Ray Lyman Wilbur.....	Mar. 5, 1929	California.....	Hoover.....	-----

¹ Entered on duty Feb. 20, 1899.⁴ Entered on duty Mar. 15, 1920.² Entered on duty Mar. 5, 1907.⁵ Mr. Fall resigned, effective Mar. 4, 1923.³ The last day of Mr. Lane's service was Feb. 29, 1920. ⁶ Doctor Work resigned, effective July 24, 1928.

LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,

Washington, November 20, 1931.

SIR: I have the honor to transmit my annual report for the Interior Department for the fiscal year ending June 30, 1932.

It is divided into three parts and a foreword. The foreword concerns policies which we have brought forward during the past four years, and their progress: Part I deals with current operations; Part II with special activities in the fields of health and education; Part III, the year's work in brief.

Very respectfully,

RAY LYMAN WILBUR,

Secretary.

The PRESIDENT.



*THE REPORT OF
THE SECRETARY OF THE INTERIOR
TO THE PRESIDENT
FOR THE FISCAL YEAR ENDING JUNE 30, 1932*

Foreword: Policies and Progress

Part I. Current Operations: General Activities

Part II. Health and Education

*Part III. The Year's Work in Brief: The Work of
the Bureaus, Territories, and Institutions*



FOREWORD: POLICIES AND PROGRESS

We have reached a new stage in the world's development. We can no longer think from day to day, from year to year, or from Congress to Congress. Our plans reach out over decades, perhaps even centuries. Our financial decisions and our economic policies must be sound, for if they are not our nation and its people live long enough to pay the bills. The Interior Department, because of its relationship to our natural resources, is under a particular responsibility for long-time planning. Government action is massive. If wise it can be helpful; if unwise, damaging to great numbers of people. As a nation, we are attempting to operate the greatest economic and social organizations in the history of man with social machinery devised largely in an agricultural civilization in which, regardless of legislation, most of our citizens were assured shelter and food. Now we have more people living on the pay roll than on the land. Safety lies in the community handling its own forces well. Our strength must come out of our own homes, and our own fields, stores, offices, and factories. We can not expect a strong country unless the individual units making it up are largely self-controlled.

In the past four years we have seen a shift in emphasis in this department's work from the liquidation of our remaining public lands to new fields of usefulness, in cooperation with local forces. These fields, generally speaking, are conservation, health, and education. Most of our administrative responsibilities still lie within the first classification, but we have explored certain new opportunities for service.

In the matter of public health these four years have seen the Federal Government take a more aggressive leadership. The White House Conference on Child Health and Protection was one of the first tasks undertaken by the new administration. It resulted in the collection and publication of the soundest facts about children ever assembled. They never could have been assembled at a time when they were more needed. Little by little, better trained child doctors, more clinics, better hospital service, more vigilance against communi-

cable disease, better school facilities, more intelligent provisions for handicapped children and expansion of vocational guidance, more facilities for recreation and protection, will grow from that remarkable document, The Children's Charter. In it this conference formulated 19 points, setting a new course for the Nation's relationship to its children. The work of that conference and the thousands of local units interested should be a continuing one.

The National Conference on Home Building and Home Ownership was called; it brought together the forces working for the eradication of slums, the improvement of housing conditions, and the amelioration of financing problems. This, also, was not a single meeting, but the establishment of a continuing movement for coordination between local units. Beside it there has now grown the great structure of the home loan bank system.

In the field of education we called into conference the National Advisory Committee on Education and for the first time the Government has before it a comprehensive blue print on that troublesome question, the relationship of the Federal Government to education.

We have transformed the Office of Education from a semiadministrative agency into one of research and service. The path of the Federal Government has been steered away from dominance in local education.

Illiteracy has been the subject of a special study through the National Advisory Committee on Illiteracy. Work has gone on in thousands of communities, through community and not Federal agencies, to stamp out that handicap under which 5,000,000 of our adults struggle.

We adopted a policy of conservation of oil and gas on the public domain; stopped speculation; weeded out unsatisfactory prospecting permits; held the public domain's oil reserves against waste during a period of overproduction; and, this accomplished, reopened the public lands to prospecting under unit operation stipulations which will insure orderly production and maximum recovery from our irreplaceable reserves.

We asked and secured the passage of the Walsh Act authorizing unit operation of oil fields on the public domain; secured the cooperation of operators in Kettleman Hills in harnessing that major field in a unit agreement, by which gas waste was cut from 450,000,000 to less than 10,000,000 cubic feet a day, and oil is now being produced

at an economic and orderly pace. We asked and secured the passage of an act allowing extension of oil prospecting permits, and were thereby enabled to halt drilling and production otherwise required by statute.

In 1929 we advanced a proposal for interstate cooperation in oil conservation through the balancing of production against a common national demand under an interstate compact. In 1930 was inaugurated the first system of national planning in the oil industry, the forecasts of supply and demand rendered by the Federal Oil Conservation Board's voluntary economic committees. To-day the interstate cooperation proposal, advanced on a nonpartisan basis by this department and the governors of the oil-producing States through the oil States' advisory committee, supported by the industry, is in active, although informal, operation. The oil industry is in an increasingly sound position.

Oil shale lands have been freed from illegal claims and together with the vast coal resources of the public domain will be conserved as a future national supply.

These four years have seen the extension and consolidation of our national park system and the addition of the first major eastern parks in the Great Smokies and the Shenandoah Valley. We have kept up national park standards and rejected all proposals for the addition of inferior parks. The National Park Service has been administered on a completely nonpolitical basis, and should be kept so.

The government of Alaska has been placed more on a basis of local responsibility, and direction from Washington has been lessened. The deficit of the Alaska Railroad has been reduced from \$1,237,120 in 1930 to \$412,416 in 1932. Roads have been brought under a civil administration and the reindeer problem is on its way to solution under the recommendation of a commission representing all interests.

The Hawaiian judicial, police, and prison systems have been recast under the direction of the governor.

The Virgin Islands were transferred from naval government to the civil government of the Department of the Interior, and a program of economic rehabilitation is under way.

A commission on the conservation of the public domain was created, and from this work resulted a new land policy, setting as its dual objectives the transfer of the nonmineral public lands to the

States, or, for the first time, adequate Federal regulation of their grazing resources.

The potash exploration program, instituted in 1927, was completed; and sufficient potash discovered to render this country independent of foreign sources during any emergency.

The great dam contemplated by the Boulder Canyon project act was financed by selling more than \$200,000,000 worth of electric power over a 50-year period, under a regional allocation which will bring the benefits of its power to 3 States, 5 municipalities, a great water district, 3 public utilities, and more than 2,000,000 users. Construction was started, the dam was dedicated as Hoover Dam, and we are to-day one year ahead of schedule in the construction work. Disagreements among California water users which threatened to prevent building of the aqueduct from the Colorado River to the coastal plain have been settled. Plans for the all-American canal have been completed.

Owyhee Dam, second only to Hoover Dam, has been completed. The great Columbia Basin project, which will surpass Hoover Dam in size, has been planned and surveyed.

We brought forward a proposal for a new Federal Power Commission, with independent officers, to supplant the ex-officio commission of which the Secretary of the Interior was chairman; and that policy was effected in legislation.

In the Indian Service we have separated out the problems of Indian property and protection of the Indian's person; appropriations for protection of health have been increased; we have furthered the transition of Indian education from a Federal function to a State one, and well over half of our Indian children are now schooled in public schools.

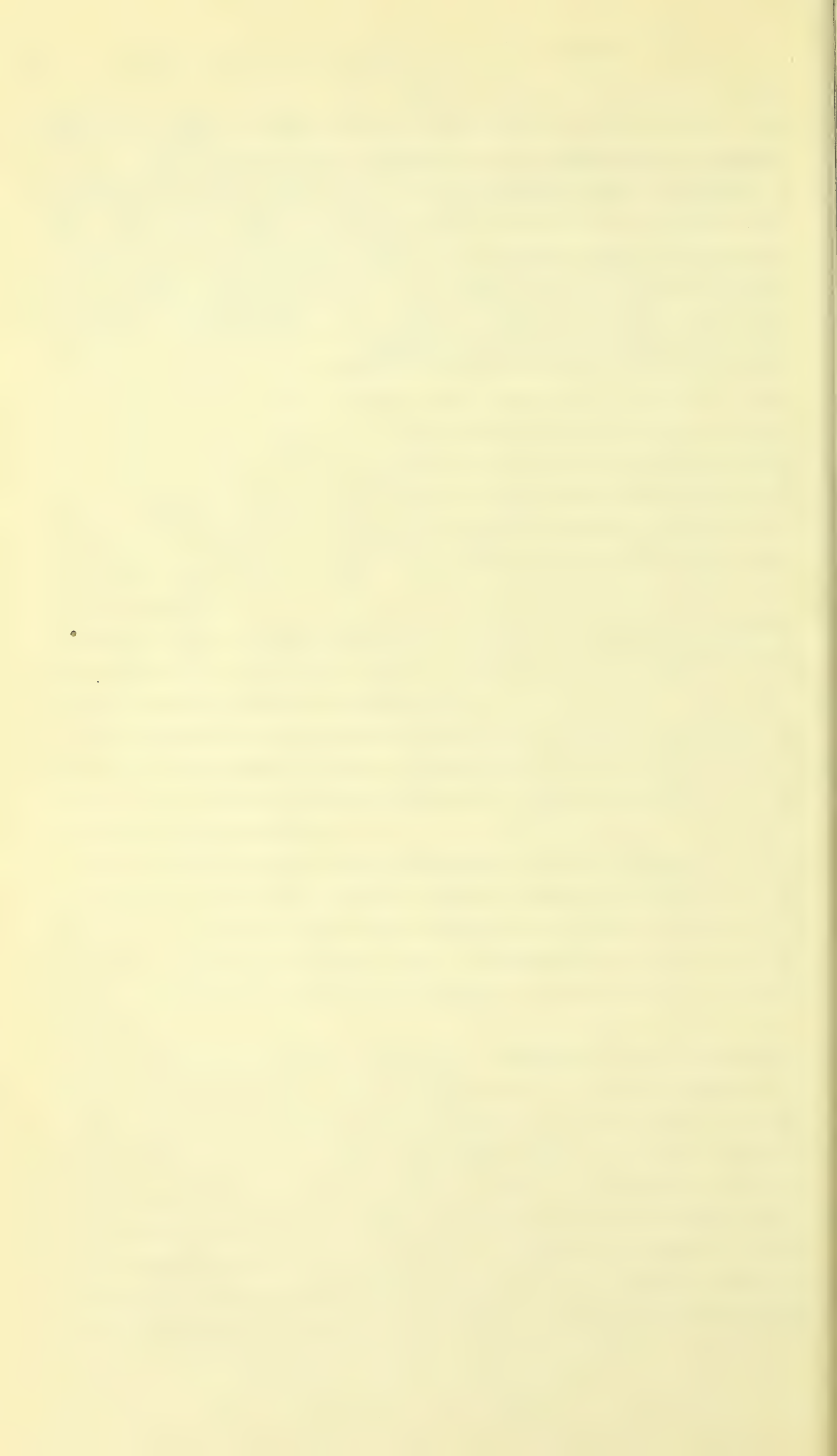
The Flathead power site in Montana was leased for the Indians at a rental which will realize more than \$2,800,000 over a 20-year period.

The Bureau of Pensions was transferred to the new Veterans' Administration, to join there the Soldiers' Home and the Veterans' Bureau, and for the first time the budgets of these groups were brought into one total, and their administration into coordination.

The foregoing are but items in the functioning of certain major policies. We have endeavored to steer a course which would keep this department free from interference with our local governments

and preserve to it certain functions of national service. We have viewed the department as a trustee and not as a governor.

In Part I, which follows, are summarized the current operations of the department in the field of its general activities, with some of the background of the past four years' effort; in Part II are references to special activities in the fields of health and education; in Part III will be found summaries of the reports of the department's administrative units—the bureaus and institutions.



PART I. CURRENT OPERATIONS: GENERAL ACTIVITIES

Reclamation: Construction—Finances.

Hoover Dam: Power—Construction.

Colorado River water.

The Metropolitan Water District.

The all-American canal.

Owyhee Dam.

The Columbia Basin project.

The General Land Office.

Grazing on the public domain.

Oil shale.

The Indian Service.

The National Park Service: The eastern national parks.

The Geological Survey.

Oil and gas on the public domain.

Kettleman Hills.

The Federal Oil Conservation Board.

Hawaii.

Virgin Islands.

Alaska.

War mineral claims.

RECLAMATION

Construction.

If we were to take an inventory of the Bureau of Reclamation's work at the end of the fiscal year, we would find 17,623 miles of canals, 742 tunnels, 894 miles of pipe, 1,477 miles of road, 120 miles of railroad, 4,044 miles of telephone lines, and 30,308 miles of transmission lines. In the structures it has built rest over 311,000,000 cubic yards of earth and rock and 5,115,964 cubic yards of concrete. This is a little more than the four and one-half million yards of concrete being placed in Hoover Dam and appurtenant works. To one who can grasp these figures, the resulting volume of concrete and excavation is equivalent to the building of a concrete highway 24 feet wide from New York to San Francisco, paralleled by a ditch 50 feet wide and 10 feet deep. These works have cost \$198,000,000, of which about \$46,500,000 has been repaid.

The work of the Reclamation Service is scattered through all of our Western States. Reclamation's concrete is the backbone and reclamation's canals are the arteries of these States.

Finances.

Reclamation is currently subject to two perils.

It is subject to attack in some quarters because it is supposed to be adding new farm lands to compete with established production, whereas in fact the policy under this administration has been to spend reclamation funds on the rescue of established projects whose water supply is inadequate. The second danger is an internal and more

subtle one. That danger is the tendency of some projects to yield to local agitation for the repudiation of their Government obligations. Some projects need help temporarily and the department is glad to assist them in securing relief; but any determined and widespread movement to get out from under the Government debt is going to dissipate the revolving fund out of which all reclamation work is financed, and destroy the inclination of Congress to provide any new funds from other sources.

In 1927 the department laid out a 10-year construction program budgeted on an estimated income of \$10,000,000 a year. All expenditures, by statutory direction, come out of a revolving fund. The income to that fund comes from three sources: (1) Revenue from the public domain, (2) from construction repayments by settlers, and (3) from hydroelectric projects. None of it comes out of the Federal Treasury, except temporary loans to the reclamation fund, which must be repaid by that fund. In 1932 the total income to the fund from all sources was about \$5,400,000, or nearly \$5,000,000 less than in the previous year, and about one-half of the annual budget planned in 1927. At the present rate the 10-year program laid out in 1927 will require from 15 to 20 years for completion.

In 1927, the year in which the 10-year program of construction was adopted, the construction payments were \$2,132,000. In 1931 these payments had increased to \$4,338,000. Then followed the drop in agricultural prices, which has been especially heavy in the States where these projects are located. This led to enactment by Congress of a moratorium relieving settlers from all construction payments in 1931 and one-half the construction payments in 1932. As a result the construction payments during the fiscal year 1932 amounted to \$1,195,000 and during 1933 are estimated at \$500,000.

Income from the public domain shrank in 1932 about one-third; the drop was from \$2,957,900 to \$1,965,000.

The future of reclamation lies largely with the settlers on the reclamation projects. The works which bring their water were constructed with Federal money, interest free. Most of these districts are on a 40-year repayment program, and some of them have been given a longer time. Freedom from interest on the outstanding investment, computed at 4 per cent, means a Federal subsidy of about \$6,000,000 a year. Every time a project exerts political pressure for further

reduction of its obligations it knocks one more foundation stone from under the whole reclamation structure.

In looking to future revenues it is apparent that royalties from the public domain will not be sufficient to replace the construction repayments which have been curtailed by legislation. A third source of revenue must be given increasing attention. That source is profits from development of hydroelectric power. Unfortunately, in this matter also, we face a conflict between local interests and sound reclamation policy. We have in operation 20 power plants. On six projects they are operated by the Bureau of Reclamation. These six brought in \$400,000 last year. That money should be devoted first to retirement of the cost of the power systems and second toward replenishment of the reclamation fund; but there is steady pressure from the projects upon Congress for diversion of these revenues to the individual project's sole credit. Power was developed on most of these projects for use in construction. As these plants were expanded and new plants constructed, not as integral parts of the irrigation system, but as commercial enterprises to be operated for profit, the question of equities in net profits assumed a different and important aspect. All of the States have contributed, from public-land revenues, to the reclamation fund, and all of them are entitled to the increment from power profits which that fund has generated. The issue is not as to how or by whom these plants shall be managed, but where their profits shall go.

HOOVER DAM, 1930-1932

Power.

The Boulder Canyon project act, which authorized the construction of a dam at Black Canyon, laid down certain conditions precedent:

We were required to contract in advance for the sale of power in sufficient quantity to reimburse the cost of the dam plus interest during construction and amortization. We were thus required to sell in advance more than \$200,000,000 worth of power, to be generated over a 50-year period. The only market large enough to make firm contracts for this block of power lay in southern California, 250 miles away and located directly over a large oil and gas area capable of furnishing cheap energy in competition with ours. And we recognized that the States of Arizona and Nevada, although not able now to contract for any of this power, should be preserved an opportunity to do so in the future. It was recognized also that the financial risk

involved must be spread upon as broad and sound a basis as possible. We succeeded in negotiating contracts whereby all of this power was sold at prices which will reimburse the United States the cost of the dam and allow a margin of safety of 36 per cent. The entire financial burden was assumed by California purchasers who, however, have contracted to release 18 per cent of the firm power to Arizona and 18 per cent to Nevada at any time within 50 years if those States demand it. Unused State power will be used and paid for by the city of Los Angeles and the Southern California Edison Co. and associates. The 64 per cent to be retained by California was apportioned 36 per cent to the Metropolitan Water District, which will construct an aqueduct from the Colorado River to the coastal plain; 13 per cent to the city of Los Angeles; 6 per cent to other municipalities; and 9 per cent to the Southern California Edison Co. (Ltd.) and associated companies. By subsequent agreement the municipalities relinquished a part of their power to the city of Los Angeles.

Thus, 3 States, 5 cities, and 3 public utilities serving 2,000,000 people, and a water district serving 13 municipalities, share this energy; it has been allocated on a broad regional basis. We have three principal contractors, the city of Los Angeles, the Southern California Edison Co., and the Metropolitan Water District, performance by any two of which will amortize the cost of the dam; and the future interests of Arizona and Nevada are protected. We have kept the Government out of the generating business; the plant is leased to the city and the company.

Revenues in excess of those required for amortization will produce a surplus of from \$30,000,000 to \$60,000,000, if the rates set in the contracts are maintained when the readjustment periods prescribed by statute are reached and if the anticipated water supply is available. This surplus will go into the Colorado River dam fund for the construction of other dams on the river. In addition, Arizona and Nevada, under a provision of the project act which grants those States a share of surplus revenues, will receive from \$300,000 to \$600,000 each annually.

Construction.

With power contracts behind us we obtained our first appropriation, and the Union Pacific commenced construction of the branch railroad on September 17, 1930. On that date the dam was dedicated

as Hoover Dam. Plans and specifications for the 730-foot dam were prepared with unprecedented speed. Electric power was brought in by a new power line of the Southern Sierras Power Co. On March 11, 1931, we signed the principal construction contract with Six Companies (Inc.), the low bidder, at a low price of \$48,890,995. This price does not include the furnishing of materials; the total estimated cost of the work covered by the contract is about \$92,000,000. The power machinery and its installation will cost an additional \$17,000,000. Interest during construction and interest during the amortization period will require a total income over a 50-year period of about \$207,000,000, covered by our power contracts.

A little more than two years after the first spike was driven on September 17, 1930, we find construction work ahead of the schedule required by contract, and the river successfully diverted through the great tunnels. This, the most crucial feature of the entire program, has been accomplished exactly one year ahead of the date originally planned.

Four tunnels, each 56 feet in diameter, have been driven through the solid rock. The four of them have a total length of nearly 16,000 feet and their concrete linings are 3 feet thick. The river, diverted now at a time of low flow, is running through these tunnels at a rate of from 5,000 to 10,000 second-feet. During the winter the temporary wing dams will be converted into 80-foot cofferdams. When the spring and summer floods come, the upper cofferdam and the diversion tunnels will be diverting a flow twenty times that of the river at its low stage. They will be capable of carrying a flood equal to the normal flow of the Mississippi at St. Louis. The November period of low flow has been the goal against which all construction work has been racing; missed by two months, it would have meant a year's delay. The goal has been reached, and at the present rate of construction the dam will be finished in 1936, barring extraordinary floods.

Work immediately in prospect is the installation of two large controls for managing the flow through the diversion tunnels.

Boulder City was transformed during the past fiscal year into a modern city of 5,000 inhabitants. It now has paved streets, electric lights, water and sewage systems, and electrically lighted homes. Dormitories are cooled in summer and heated in winter. It is the most modern construction camp yet built, and is being administered by Federal officers on a high plane.

During the past year the contractors have been engaged in litigation with the State of Nevada, in which the United States has taken part. That State has endeavored to enforce its own taxation laws and its own administration within this Government area. The United States does not propose to acquiesce in the harassing of this Federal project by taxation or by the exchange of unified Federal control for conflict with the peculiar Nevada policies relating to gambling, segregated vice districts, etc. This is the Federal Government's job and the Government proposes to administer it. Eighteen and three-quarters per cent of all surplus revenues from power operations will go to Nevada in lieu of taxes, and further than that the department is not prepared to go.

COLORADO RIVER WATER

In 1929 we faced disputes among California claimants to Colorado River water which threatened to indefinitely postpone the building of the all-American canal and the Metropolitan Water District's aqueduct. These problems have been settled. Through the cooperation and the recommendations of the State water authorities we have secured an agreement among seven California interests for the allocation of the water available to that State. Under that agreement the first 3,850,000 acre-feet is divided among the agricultural areas now using Colorado River water, plus certain areas which may be added. The next 1,100,000 acre-feet is allocated to the Metropolitan Water District of Southern California which will supply domestic water to cities of the coastal plain; and the balance is available for additional agricultural uses.

THE METROPOLITAN WATER DISTRICT

In 1930 this department contracted with the Metropolitan Water District of Southern California for sale to it of 36 per cent of all Hoover Dam firm power, and gave that district an option on all secondary power to be generated at the dam. The water requirements of the Southern California coastal plain were regarded as the highest use which this power could serve. We had confidence in the district's promise to authorize a bond issue and proceed with the work. That confidence has been justified. During the past year the district, after successfully voting a bond issue, has obtained a loan of \$40,000,000 from the Reconstruction Finance Corporation, and

work is expected to go forward at an early date. Negotiations between the department and the district have been under way some months looking to the construction of a dam near Parker, Ariz., for the joint benefit of the district and of public and Indian lands in Arizona, and the contract will probably be closed in the near future.

THE ALL-AMERICAN CANAL

On November 3, 1931, the Secretary approved as to form a contract with the Imperial Irrigation District for repayment of the cost of construction of the proposed all-American canal, a project to cost \$35,000,000, and designed to carry Colorado River water into the Imperial Valley and adjacent areas in California. The contract required the inclusion of certain additional lands, particularly in Coachella Valley. After its ratification by Imperial Valley interests, Coachella Valley decided not to merge with Imperial. The contract has not yet been consummated because of these local differences. Negotiations are currently under way between the two groups for revisions of the contract which will permit the work to proceed.

OWYHEE DAM

Hoover Dam's nearest rival is the Owyhee Dam, completed in July of this year and built by the Bureau of Reclamation. That dam, 405 feet high and now the highest in the world, will store water for areas in Idaho and Oregon.

COLUMBIA RIVER BASIN

We have completed surveys for the Columbia River Basin project. We are ready to go forward with the construction of the great dam, a straight concrete gravity structure, 450 feet high, 4,100 feet long, containing 11,266,000 cubic yards of concrete and generating 2,100,000 horsepower, whenever Congress authorizes it. This project will ultimately be to the Northwest what Hoover Dam is to the Southwestern States.

GENERAL LAND OFFICE

The General Land Office is historically the land agent of the Government. It has disposed of the public land in response to the directions of Congress; it has adjudicated claims to these lands, and has conserved, as best it could under the powers given it, the public

domain remaining in Federal ownership. It has consistently sought Federal legislation enabling it to do its conservation work on a more effective scale, particularly in the control of grazing; but not until this year has an adequate bill progressed as far as a favorable report by a congressional committee. Such a bill is now pending and is discussed on another page.

The Land Office is the custodian of 173,000,000 acres of public domain subject to all the applicable public land laws. It exerts more or less jurisdiction over another 100,000,000 acres—areas which have been withdrawn from operation of the land laws, or in which the Government has parted with the surface title but retained the mineral title. The national forests, comprising 186,000,000 acres, are administered by the Department of Agriculture, except as to minerals and title matters, which are intrusted to the General Land Office.

The forests, the vacant public lands, and the public lands withdrawn or on which minerals are reserved total slightly less than 400,000,000 acres. Alaska contains another 378,000,000. The grand total of the remaining Federal estate thus totals better than three-fourths of a billion acres. The task of administering the disposition of the three-fourths of it which remain in this department's jurisdiction is not a small one. The work is carried on at a low cost.

Last year the General Land Office took in a total of \$4,065,210.76 from the public lands on account of sales, leases, and other dispositions. Its total expenditures amounted to \$2,204,224.16. The balance remains only temporarily in the Treasury, however. Under the statutes, 52½ per cent of revenues under the mineral leasing act is paid into the reclamation fund, 37½ per cent goes to the States, and only 10 per cent remains in the Treasury. Thus, last year \$2,100,555.87 went into the reclamation fund; the public-land States and certain counties within such States received \$1,402,420.93, and the Treasury only retained proceeds of public lands to the extent of \$562,233.96.

Among other activities of the General Land Office in 1932 were: The surveying of nearly 3,000,000 acres of new land and the resurvey of 1,165,000 acres in 23 States and the Territory of Alaska; the administration of over 20,000,000 acres of homestead entries, of which 4,500,000 acres were entered in the past year; the investiga-

tion of 27,000 land cases and the preparation of 32 court cases, of which 29 were won by the Government; the adjudication of 7,110 prospecting permits; the issuance of 53 oil and gas leases; the transfer of nearly a million acres to the national forests; water power withdrawals amounting to about 10,000 acres; covering into Federal reservations of various sorts about 6,000,000 acres; the maintenance of engineering offices, field service offices, and local land offices for the service of the public; the adjudication of over 1,600 mineral cases; the receipt of 38,000 homestead cases; the furnishing of about 13,000 township plats; the adjudication of 786 mineral entries; the issuance of 81 coal permits and 102 potash permits; the adjudication of 880 sodium cases; the rendering of judgment on 1,372 oil-shale locations, filing of charges against 14,395 more; and so on. The statistics of its activities could cover several pages; and each transaction which goes to make up these large totals represents a vital service rendered to the public.

In the fiscal year 1932 the General Land Office appropriation, excluding money disbursed to the States and other nonadministrative items, was \$2,239,400, or one twenty-fifth of 1 per cent of the National Budget. For 1933 the expenditure authorized is \$1,883,300.

GRAZING ON THE PUBLIC DOMAIN

In the first session of the Seventy-second Congress two vitally important bills were introduced with the department's indorsement—one designed to carry into effect the recommendations of the President's Commission on the Public Domain, which if enacted would result in the transfer to the States of the unappropriated nonmineral public lands, and the other a bill authorizing the Department of the Interior to regulate grazing on the public lands. As we have pointed out in the past, the remaining public lands are chiefly valuable as grazing areas, and their protection is essential to the welfare of the States in which they are located, as well as to the preservation of this national asset. In the past the State has had no authority to regulate grazing upon them, and Congress has conferred no such power on any Government department. Either the States or the Federal Government must do the job. We believe these Western States are full-grown and need not look to an absentee landlord to protect their interests. But if the States do not accept the responsibility, and if

the Federal Government is to bear it, then adequate authority should be conferred on this department.

The Public Domain Commission's bill which we have indorsed would, in any event, offer the State three alternatives—to take over these lands for their own administration immediately, or to petition for their Federal administration as "national ranges," or, in the event of nonaction by the State for 10 years, the automatic creation of such ranges on Federal initiative. It is evident that a considerable time will elapse before a physical transfer to the States is completed, and we have therefore been pleased to indorse the Colton bill also, which would vest in this department immediate authority to regulate grazing. When the lands pass to the States the responsibility for their care can pass with them. The Colton grazing bill has the indorsement of the Department of Agriculture, as well as this department, and has been favorably reported by the House Committee on Public Lands.

OIL SHALE

The deflation of oil-shale claims continues. Just before the passage of the mineral leasing act of 1920 several million acres of oil-shale lands in Colorado, Utah, and Wyoming were located under the mining laws. The mineral leasing act preserved to the locators the right to perfect their claims to patent under the old laws, which require a certain amount of assessment work each year. By 1930 it had become apparent that because of increasing crude-oil production and postponement of the use of oil shale as a substitute, very few of these claims were being maintained by assessment work; and that the outstanding claims constituted an unsatisfactory cloud on the Federal title. We accordingly undertook a house cleaning, somewhat comparable with that undertaken as to the oil permits several months previously, by instituting proceedings against all invalid outstanding claims. It was a tremendous task involving the filing of charges and the preparation for trial of cases against about 22,000 claims, covering about 2,600,000 acres. When the work was well under way, it may be recalled that one of our employees at Denver, a man named Ralph S. Kelley, who apparently had been harboring a fixed idea that the United States was being defrauded of these lands in some way, sold to the now defunct New York World some distortions of

information he had abstracted from Government files in return for \$12,000. The World's series of "revelations" proved a fiasco, but the resulting work, involving an investigation by the Senate Public Lands Committee, necessarily delayed us. Now, however, the proceedings against these claims have been largely completed. Twelve thousand ninety-nine claims have been adjudged null and void and the area remaining subject to adjudication has been reduced to 1,165,000 acres. Those claims which have been legitimately maintained are, of course, being permitted to proceed to patent, and efforts are made to protect all equities.

INDIANS

In 1932 the Federal Government appropriated \$25,612,046.73, including some expenditures in Alaska, on behalf of citizens of Indian blood. Their number does not exceed 320,000. No other dominant civilization has made a comparable effort on behalf of an aboriginal population.

We are working with a race which has few inclinations to keep pace with its competitive surroundings. A century of protection and artificial support is partly responsible. The Federal Government's relationship to the Indian population is on an abnormal basis; no other segment of our population has its business affairs, its education, and the care of its health superintended by the Federal Government. Whatever contact the normal citizen has with the sovereign in these problems is a contact with the State government. That relationship must inevitably come for the Indian. But the Federal responsibility can not be withdrawn fairly unless and until the States are willing to assume the peculiar responsibility which the Federal Government has recognized; that is, the responsibility to lead these Indians into competent citizenship, and to protect their persons and property until the process is completed. It looks like a long process; but in the past four years there has been a sufficient change in direction in Government policies to bring the goal within sight. We are not out to capture any more Indians, and our aim is to qualify those Indians now under our care, and their children, to take their place in the competitive system which surrounds them. That means the ultimate breaking up of the reservation system and its artificial islands in our civilization. Because of a racial tendency toward dominance of the tribe by the old people, it is difficult to make education "stick":

youngsters, having no kindred associations in white communities and having a characteristic homeward urge, have naturally drifted back to the home community and to its lack of independence. The progress of the Indian and of our assistance to him will always be hampered by a vociferous and emotional fringe of white people who encourage his grievances. The Indian suffers alike from enemies who exploit his property and friends who exploit his grievances.

We see no valid reason why those who have more than one-half of white blood should not be promptly released from the wardship imposed by the Government and given control over their persons and property.

Health and education.

References to Indian health and educational problems will be found in Parts II and III of this report.

Property.

In agricultural work we are endeavoring to further the Indians' interest in subsistence gardens. The Indian, speaking generally, was not by nature a farmer, and the Government's efforts to make him one have not been any more successful than could be expected. He is a hunter who has outlived the game animals and finds himself surrounded by an agricultural and industrial civilization. We have stressed the exploration of his possibilities in industry. During the year a director of employment was appointed. We have under way an effort to divert Indians into industrial opportunities, both on and off the reservations. The progress, slow at best, has been rendered doubly so by the depression.

The Government has undertaken reclamation for the Indians as it has for the whites. The work has been separately administered in the past; there has been little new construction during the past year. In the future there should be opportunities for closer coordination of the engineering work of the Bureau of Reclamation and the Indian irrigation service, leaving to the latter the administrative field. It is questionable how much of the Government's investment in reclamation work for Indians, theoretically classed as reimbursable, will ever be repaid.

A statute enacted during the past year directs a readjustment of some of these charges. Further construction charges are deferred as

long as the land remains in Indian ownership. Old charges can be written off or reduced, subject to the approval of Congress.

Property: Pueblo lands.

In 1924 Congress enacted a unique piece of legislation known as the Pueblo lands act. It proceeded on the theory that the United States had been negligent in failing to protect certain Indian Pueblo Tribes in New Mexico against the loss of their lands to non-Indian settlers, and authorized the creation of a board to find what part of the lands could have been recovered by seasonable prosecution in the Indians' behalf, and directed payment by the United States to the Indians in compensation for lands lost. Conversely the board was authorized to find out what lands now in white possession still remained recoverable for the Indians. The board was directed to recommend to Congress the compensation to be paid the white settlers; For a number of years the board created carried on the exceedingly complicated work of tracing old Spanish and Mexican titles and historical claims to possession of the Pueblos, made findings as to what land had been lost to the Indians through negligence of the Government and what lands could still be reclaimed from the whites, and ended by awarding to the Indians \$620,949.28 and recommending payment to the whites of \$217,250.22. During the past year an effort has been made in Congress to more than double the Indian award and to add to the white award. The principal claim for the increased award has been based on the charge that the Indians have lost water rights in excess of the rights for which the board compensated them. The department, finding that the board had specifically reserved all water priorities and believing them to have many times the value assigned to them by this bill, has refused to admit their loss and has refused to acquiesce in a payment based on such a ground, which would inure solely to the benefit of the white settlers who claim to have acquired water rights inconsistent with these reserved priorities. As it appears that the other bases offered for the increased award are vague and contradictory, the Government has insisted on protecting these Indians by requiring a new investigation of these issues before the new figures are accepted. Incidentally, the proposed bill carries with it, subject to the Indians' consent, a fee of 10 per cent, or better than \$70,000, for the lawyers who drafted the legislation and urged it on Congress. The department is not particularly impressed with that item. If the Pueblo Indians are entitled

to additional compensation, the department will certainly favor their securing it; but not until a basis for it is proved which does not imperil Indian water rights and which can be accurately determined to be a claim on the Treasury.

THE NATIONAL PARK SERVICE

More than three and three-quarters million people visited the national parks and monuments in 1932. The figure is about 200,000 higher than that of the year before, but the increase was due to the Colonial National Monument, where travel was counted for the first time, with 400,000 visitors. The use of the national parks by our people has been remarkably well sustained during this period of depression; there has apparently been a great appreciation of their recreational values and of the low cost at which they may be enjoyed. Their sustained use is gratifying; but there has been a serious shift in the character of facilities which our visitors are using. The hotel and cottage facilities in the parks represent private investments whose rates and charges are regulated by the Government under contract. The depression has brought a serious drop in patronage of some of these facilities, particularly the hotels and transportation lines. There has been a decline in rail travel and a shift toward the use of private automobiles and private camping equipment. We face a problem in the future stability of our contractors and in the service they can render. This trend is a factor which can not be completely controlled; it will be unfortunate if the down curve in the use of these facilities continues.

Public attention should be called to the danger facing the park forests, particularly in Yellowstone National Park. A beetle infestation there threatens the destruction of the lodgepole pine, which constitutes about 80 per cent of Yellowstone's forests. If we had from \$3,000,000 to \$5,000,000 immediately available we might have an even chance of saving these trees. Congress has not felt it possible to appropriate the money and it has not been forthcoming from private sources. In a lesser degree the same danger threatens the forests in other parks. It will be recalled that through the generosity of John D. Rockefeller, jr., the Government was enabled to purchase an area of great sugar pines in the vicinity of Yosemite and to save them from logging; those trees are threatened by another type of beetle infestation, and adequate control methods are imperative. White-pine

blister rust has appeared in Mount Rainier National Park and control measures last year resulted in the saving of selected stands of white pine. In connection with all insect and tree-disease control in the national parks, the greatest need of the National Park Service at the present time is for type-map surveys, to show the various types of forests in the parks, to what disease or infestation they are subject, and the cost of control measures.

Alongside these serious problems it is a pleasure to record the progress of the system. Last year two new national monuments were added and the areas of six parks and four monuments were increased. Progress was made on the elimination of privately owned lands within park boundaries; enabled by exchange acts, appropriations, and gifts, we acquired over 21,000 acres of private holdings. The Great Smoky Mountains National Park in North Carolina and Tennessee progressed toward full park regulation. Nearly 140,000 acres of land were presented to the United States by the two States on November 2, 1931, and they are proceeding to add certain additional areas. The total acreage now within the park is 297,719.70; when titles have been approved and when the total acreage of 427,000 has been reached, this park will come under full administration by the National Park Service.

Mammoth Cave project in Kentucky has not yet acquired national park status, but the Mammoth Cave National Park Association is continuing to acquire lands for that purpose.

Satisfactory progress continues on the Isle Royale project in Michigan.

A bill for the establishment of the Everglades National Park in Florida has passed the Senate and is awaiting action in the House.

All of these projects are characterized and made possible by the enthusiasm of private citizens; this is one form of governmental activity whose extension is generally welcomed because it means the protection of national treasures with a minimum of interference in local matters. There remain certain areas in which we encounter local opposition. Unfortunately some vitally necessary additions to the Grand Teton National Park in Wyoming remain incomplete despite the readiness of the owners of these lands to donate them to the Government. The obstacle is the opposition of Wyoming local interests to the transfer of these lands from the local tax rolls to the Nation.

Another great project still in a formative status is the Kings Canyon country near Sequoia National Park. There we have faced difficulties in reconciling local interests in water-power sites and in administrative matters.

The whole national park movement is too close to the hearts of the people to be more than momentarily halted by superficial obstacles.

Wild-life protection continues to be a major interest of the Park Service. The great game herds of Yellowstone have been the subject of a cooperative survey with other Federal services and State authorities. The mule deer on the Kaibab Plateau adjacent to Grand Canyon National Park continue in a precarious position, with the stock of deer at an admittedly low ebb.

Fishing has been good.

The bears, encouraged by feeding by their visiting friends, continue to be numbered among the more troublesome wards of this department.

All visitors to the national park are impressed by the careful landscaping work done there. Roads are built where they will be least obtrusive, fire-control plans are carefully worked out, and buildings are designed and built and colored to harmonize with the scenery.

The Park Service is engaged in the preparation of what it calls a master plan for each national park. These plans are intended to lay out 6-year advance programs for roads, trails, buildings, special areas, utilities, camp sites, and so on.

Some interesting engineering work has been completed and more is in progress. We have added an elevator at Carlsbad Caverns National Park to save the long climb of 750 feet from the floor of the cave to the surface. The 4,200-foot Wawona Tunnel in Yosemite National Park has been completed. The grading of the Transmountain Highway across Glacier National Park is nearly finished; its rival, the new road across the mountains of Rocky Mountain National Park, is completed.

All of this work is done on a modest budget, the greater part of which goes into labor-producing expenditures. In 1932 the Park Service received a total of \$12,831,250. During 1933 current operations are conducted under an appropriation of \$10,640,000.

This investment in the improvement of national park facilities for public enjoyment is one of the soundest which the Government makes.

THE EASTERN NATIONAL PARKS

The wave of settlement and distribution of the land had reached the western mountains before the conception of the national parks. Certain unique and beautiful areas had not lent themselves readily to exploitation. Thus, just in time, our Government was able to carve out of the available public lands, without direct expenditure, those great western national parks which are the glory of the Nation. The idea of the national park having gotten into our general thinking, it became evident that certain beautiful areas in the East had been passed over. There were only two ways in which they could come into possession of the Nation, and these were by gift or purchase. When one such national park, the Acadia, in Maine, was acquired through the generosity of private citizens, it was demonstrated that by extraordinary efforts other lands could, if the right kind and amount of energy were put behind the movement, be added to the national park system.

In the past four years we have brought into the national park system a series of great eastern projects. Some of them remain incomplete, awaiting the acquisition of lands or the availability of money; but the policy of acquiring them has been established here and has been fixed in legislation. The Great Smokies in North Carolina and Tennessee, parts of the Shenandoah Valley in Virginia, the Mammoth Cave National Park in Kentucky, and Isle Royale in Michigan are now approved projects, and one branch of Congress has voted to authorize an Everglades National Park in Florida. John D. Rockefeller, jr., has given millions of dollars to this work.

It is becoming increasingly apparent that private assistance should be centralized in some manner, possibly through the creation of a national park trust fund.

THE GEOLOGICAL SURVEY

Congress cut the appropriation⁶⁷ for the Geological Survey for the current fiscal year 25.8 per cent. That great bureau of scientific and technical service, devoted entirely to work essential to the public interest and available to the public from no other source, is therefore proceeding under a reduced head of steam.

Its topographic map of the United States, pushed with all the funds available each year, has included only 45.2 per cent of the United

States; and only 10 States, the District of Columbia, and Hawaii are completely mapped. The greater part of this work is done in cooperation with the States. Last year 25,893 square miles were mapped. These maps are of basic importance to a wide variety of undertakings. They have literally hundreds of uses.

The Survey carries on each year its investigation and publication of data on the Nation's water resources. It supplies authoritative information on the quantity of water available. Reliable data are of the utmost importance to agricultural communities; to States, counties, and municipalities; to irrigation districts, to industries, to permittees and licensees of the Federal Power Commission, and to many others. Much of this work, also, is done in cooperation with the States, with funds provided in part by them. Last year \$600,000 was appropriated by Congress for this work. With that money and the cooperation extended by 40 States stream-flow measurements were made in 48 States and 2,791 gaging stations were maintained. These surface-water surveys are supplemented by investigations of ground water, of power and reservoir sites, and of the chemical quality of both surface and ground water in their relation to agricultural and industrial uses. Last year the ground-water work was carried on in 25 States and Hawaii, and in this work 16 States and Hawaii cooperated. Samples of water and of water-bearing material were analyzed. Power resources were reviewed, and monthly and annual reports on the production of electricity and on the consumption of fuel by public-utility power plants and an annual report on developed water power were published.

The Survey carries on general investigations which tend to discover the fundamental facts and to develop the general principles on which the science of geology is based, and in the application of those principles to surveys of special areas it contributes to the knowledge of the mineral resources of the country and to the best methods of their utilization. It aids the great metal-mining industry in many States by making comprehensive studies of the mining districts. Most of the leading mining States have cooperated with the survey in support of such work. The reports that the survey issues are widely used in mining development.

It surveys the reserve supplies of coal, petroleum, gas, phosphate, potash, and other mineral resources on the public domain and elsewhere in the United States. It prepares and publishes detailed

geologic maps of particular areas and more general geologic maps of States and of the entire country that are indispensable to the mining industry, to geologists, and to educators.

The investigations of the mineral resources of Alaska carried on by the Geological Survey aim to explore, make known, and aid in the development of the mines and minerals of our great northern possession. Less than one-half of the territory has as yet been surveyed even on standards regarded as appropriate for reconnoitering the mineral deposits it may possess, though tens of thousands and possibly hundreds of thousands of square miles of the unsurveyed area appear to be such as to justify examination to prove whether or not they may contain workable ore bodies. Not only are the results of these surveys used by all concerned with the development of mining in the territory, but the maps and general information secured in the course of these investigations are relied on by almost every one concerned with any industrial undertaking in Alaska.

All of this information constitutes data not available from any other source. These investigations constitute a field of service to our citizens. The Geological Survey is in general not an administrative agency. It is a service body, and the curtailment of its work slows down a score of fields of private activity of our citizens dependent upon its data.

The Survey also bears the responsibility of classifying the public lands with respect to their mineral, water power, and agricultural value. It carries on supervision of mineral and water power development on such lands in cooperation with the General Land Office and Federal Power Commission. Coal and mineral withdrawals; oil-shale classification; definitions of "known geological structures"; designations of homestead areas; and many other scientific findings upon which depend the availability or nonavailability of our public lands for private acquisition are all made by the Geological Survey, and the public suffers from curtailment of its functions. Adjudication of about 13,000 applications for land was aided by its advisory reports on the character and utility of the areas involved. During the year it added 4,712 acres to the area included in power reserves, making a total of 6,570,185 acres in 21 States and Alaska from which about 15,000,000 horsepower can be developed. This is conservation work of the first rank.

It supervises directly all oil operations on the public domain. During the fiscal year 1932 the public domain produced nearly 26,500,000 barrels of oil under the supervision of the Geological Survey, or about 3 per cent of the country's total production. The revenue from the oil and gas and mining operations supervised amounted to nearly \$3,500,000.

It publishes scientific data of an authoritative character. During the fiscal year it published 182 books and pamphlets, 171 new or revised maps, and 378 reprinted maps. Among them is an outstanding publication on geological conditions in Teapot Dome, another on geological conditions of the Kaiparowits region in Utah and Nevada, another on geological conditions of the Bonanza mining district, Colorado, one on the potash fields of New Mexico and Texas, and a water-supply pamphlet dealing with methods of estimating ground water supplies.

It operated during the fiscal year 1932 on an appropriation of \$3,141,740, or about one-fifteenth of 1 per cent of the Nation's Budget. For 1933 the figure is \$2,615,400.

OIL AND GAS ON THE PUBLIC DOMAIN

On April 4, 1932, we embarked on the second phase of the conservation policy on the public domain. On March 12, 1929, we had ceased the issuance of new prospecting permits, although we continued to extend all those which could establish equities. Those which had failed to comply with the law's development requirement were canceled. It was a house-cleaning process, designed to weed out speculative operations during a period of overproduction in the oil industry, when stimulation of new production on the public domain would have meant dissipation of our reserves and damage to the industry. That process resulted in the cancellation of 16,600 out of approximately 20,700 outstanding permits. Attacked in court, the Secretary's authority to refuse to issue new permits was sustained by the United States Supreme Court. The regulations of April 4, 1932, were made possible by the Walsh amendment to the mineral leasing act, authorizing unit operation. These regulations set up a set of stipulations upon which new prospecting permits will issue. These stipulations required the permittee to submit a plan for unit operation of the geological structure upon which his permit is located and to produce no oil or gas except in accordance with a unit plan approved by the

Secretary. Similar stipulations, coupled with a right to hearing, are incorporated in extensions of existing permits. The result is an assurance that our reserves will be produced only under orderly methods which will prolong their life; and that the industry will not be threatened by the outbreak of uncontrolled production on any new public domain field. Unit operation has proven a success in the great Kettleman Hills North Dome field, where the operators entered into such an agreement under the department's encouragement.

KETTLEMAN HILLS

The Kettleman Hills North Dome, one of the country's most prolific oil fields, is being produced under a unit operation agreement, consummated in 1930. It embraces all of the public lands in that field. This system enables the Government lessees whose lands are checkerboarded by alternate sections of private holdings to compete as a unit in these privately owned areas in the extraction of the oil. The unit's relations with outside owners have been satisfactory; but the usual minority of outside holdings has insisted on producing more than its proportion, and the Government lessees have shown a fine spirit of cooperation in restricting their own production to keep the field's total within allowable limits.

Relations between the Government and its lessees in this field have on the whole been excellent and the unit plan has operated successfully. There has been a fundamental difference of opinion between the Government and the lessees as to the basis upon which Government royalties should be computed, and it is probable that litigation of a test case will be required to set this important issue permanently at rest. The issue is whether the values on which royalties are computed shall be fixed by the prices the lessees receive (being in some cases prices quoted in transactions between two departments of the same company) or whether the values shall be fixed by the Secretary. We have endeavored to lay the basis for equitable solution through litigation.

THE FEDERAL OIL CONSERVATION BOARD

Cooperating with the Departments of War, Navy, and Commerce, through the Federal Oil Conservation Board, we initiated in 1930 the first system of national planning in the oil industry—a system of periodic forecasts of demand and recommendations of crude-oil

production to meet it—and laid the foundations for an interstate compact to put this work, under auspices of the oil-producing States, on a permanent and effective basis. Refinery operations were cut back to the equivalent of a 6-day week. Imports of oil, during a period of domestic overproduction, were cut 25 per cent at this board's request. The board's plan, now being advanced on a non-partisan basis by the oil-producing States through their "Oil States Advisory Committee," calls for an interstate agreement on four essentials:

(1) The creation of a joint Federal and State fact-finding body to forecast demand, recommend crude-oil production, and allocate it among producing States and imports.

(2) A commitment by each producing State to adhere to its quota.

(3) Federal regulation of imports to keep them within the prescribed quota.

(4) Formulation by this interstate body of uniform conservation principles for adoption in local legislation centering around unit operation and the preservation of reservoir energy.

HAWAII

Hawaii has suffered during the past year from the notoriety attracted by one criminal case, and its aftermath, a lynching. Despite the exploitation of that case by sensational newspapers, Hawaii remains one of the most peaceful communities of the world. It is free from organized graft and corruption, the courts there are well administered, and even in Honolulu the proportion of crimes of violence is distinctly lower than that in a majority of mainland cities. One benefit which the Territory has derived from the notoriety of the past year is the local support drawn to the governor's program, which he has urged for several years, for remodeling of the police and prison system and the method of selecting juries. These have all been easy-going, in tempo with the peaceful character of the people. The island's principal problem now is the counteracting of the influence of a chain of mainland newspapers which have done their best to promote racial controversy within the islands and prejudice from without. We propose to continue to insist upon the American policy of local self-government and to hold the local government responsible for the results. We trust that this experience has aligned the solid elements

of the island's population behind the governor's program of judicial and police reform.

VIRGIN ISLANDS

The Virgin Islands were acquired by the United States from Denmark in 1917, solely for their strategic position as an outpost of military defense of the Panama Canal. With the cessation of the World War and the subsequent years of peace, a diminution of this military importance has taken place. The Navy has long since discontinued its naval base at St. Thomas, and its complete withdrawal from the islands was effected by the Executive order of February 27, 1931, transferring the supervision of the government to the Interior Department. A civilian administration was installed and the problem of rehabilitation was begun shortly thereafter.

In order that an idea may be obtained as to the nature of the difficult situation confronting us, it should be observed that the per capita wealth of the Virgin Islands is about one-tenth what it is in the United States. How poor the masses of the people are may be understood when it is realized that in order to vote a man must have an income of only \$300 a year, and yet only 908 men out of a total population of 22,012 in the islands can qualify as voters. The plight of this comparatively small group of our citizens is worthy of the recognition being given to it by our Government. The people of the Virgin Islands were absorbed as an integral part of the United States and made American citizens some 15 years ago, and thus a responsibility for their economic and moral welfare was definitely established and sympathetically assumed. Since the United States acquired these islands it has spent more for their welfare than the former sovereignty had spent in 200 years. Our government is making a philanthropic experiment in the aid of this people without gain to itself.

The rehabilitation program was well started during the year and, while necessary delays were encountered in the clearance of titles to lands for the homesteading and hotel projects, the entire program has moved with expedition and a spirit of cooperation which augurs well for success.

Every effort is being made to initiate and further all projects which tend to promote the welfare of the people of the Virgin Islands with the ultimate objectives of improving their standards of living

through a coordinated educational program and leading them upward to a position of economic self-sufficiency.

ALASKA

The act of June 30, 1932, transferred the duties of the Board of Road Commissioners in the Territory of Alaska to the Secretary of the Interior. Formerly this activity functioned under the War Department with a large civilian staff in the field. Under the new plan Army officers theretofore detailed to the road work in Alaska have been relieved and a civilian staff placed in charge of the work. Under the reduced appropriation provided by the last Congress practically the only work will be maintenance of existing highways.

Reindeer investigations.

The reindeer industry in Alaska has been receiving the active attention of representatives of the department in the field since the spring of 1932. A special force of field representatives has been in the Territory during the past summer for the purpose of reorganizing the administration of reindeer, following recommendations of the reindeer committee appointed by the Secretary of the Interior on November 5, 1930. This committee, consisting of Hon. John B. Kendrick, United States Senator, Hon. Scott Leavitt, Representative in Congress from Montana, and Hon. Charles P. Sisson, Assistant Attorney General, found the major problems to be herding and marking, establishment of new range rules, and marketing. After a season of intensive work in the Seward area, the field representatives of the Interior Department are now preparing their reports and findings for the consideration of the Secretary of the Interior.

WAR MINERALS CLAIMS

War minerals claims are being adjusted under authority of an amendment to the original act, passed February 13, 1929, which amendment gave claimants the right to take their claims into court, and under decisions of the Supreme Court of the United States, dated December 7, 1931, by which decisions the Secretary was required to pay losses incurred in the purchase of property and in interest paid on borrowed capital. Since receipt of the first court decree 85 claims have been adjusted and awards totaling \$405,532.04 have been made, accepted, and certified for payment.

PART II: HEALTH AND EDUCATION

Child health and protection: The White House conference.

The Conference on Home Building and Home Ownership.

The Government and the cost of medical care.

Indian health.

St. Elizabeths Hospital.

Negroes.

Freedmen's Hospital.

Policies in Education.

The Office of Education.

School finances.

Illiteracy.

The radio in education.

Indian education.

Howard University.

Columbia Institution.

CHILD HEALTH AND PROTECTION: THE WHITE HOUSE CONFERENCE

An advancing civilization is characterized by its preservation of dependents of all sorts. The controlling idea in the saying "Women and children first" is an almost instinctive reaction of preparation for the future. In the century that we have been building up our present form of world civilization based on the striking advances made in information and in the practical application of inventions and discoveries, we have learned to think of our children in other terms than as prospective cannon fodder or as brainless working machines.

The biological facts of life, the necessity of the established wholesome and simple home, remain the same, but the machine, the engine, the steamboat, the radio, telegraph, and the telephone, have given us and our children millions of neighbors; and with these and the problems which they bring, we and our children must learn to work and to live.

We have been so close to the benefits derived from the discoveries of such men as Pasteur and Koch that we have failed to grasp the revolutionary effect that they have had upon the protection of childhood. Our new knowledge of nutrition, particularly of infant feeding, has had much to do with the improvement in our morbidity and mortality rates. The White House Conference on Child Health and Protection took the measure of these present methods and outlined for us many undeveloped possibilities for the future.

In that conference were brought together several thousand people interested in this field: Officials, doctors, and the people themselves,

represented in women's organizations, newspapers, radio, and so on. The work of that conferences includes not only a vast amount of preliminary investigation but the printing of a series of authoritative publications during the past year. These books constitute the first encyclopedia on child health and protection available to the forces of this Nation fighting in that cause. This work was followed by a continued series of State conferences which should go forward, regardless of any change in administration.

In 25 years our people have built a whole new structure around scientific methods, public-health workers, public-health nurses, and nutrition experts. The accomplishments of that period have been showing up for the benefit of our children during this depression; the mortality and morbidity figures for children have shown a significant decrease during this period of strain, largely because there was in existence a slowly built structure of public assistance.

In the White House conference it was recognized that while much was being done there was loose organization and coordination between the forces working for the welfare of children. The school was doing its work well, the playground was of growing importance, the health departments were effective organizations, and the welfare agencies and workers were doing a good job. But a common approach to all of the forces dealing with the child was necessary if the best job possible was to be done. Out of the conference came a new unity and an authoritative program for the children of America. It was a gigantic self-survey of far-reaching significance.

It was found impossible in that conference to separate education, health, recreation, and welfare. In this conference and its follow-up work there is a rare opportunity for a continuation of the interest of the public in public health with particular reference to children.

The conference brought out the need of a harmonized social program for children. Health, education, recreation, and welfare each has its own weight and importance, but each can play its full part only when joined with the other. Children are living single complexes. Unity of plan is needed for all of the forces which build them up and give us a great Nation.

The White House Conference on Child Health and Protection brought together the available knowledge of what is happening to the children of this country in the schools, in their communities, as

well as in the clinics, the courts, the hospitals, and the various institutions. Instead of thinking in terms of certain types of children, the endeavor was to have all children studies, regardless of economic status or behavior. Particular efforts were made to round out the studies of childhood by securing information regarding those who were handicapped by blindness, speech defects, deafness, heart disease, or other physical elements, and by damaged nervous systems. Emphasis was given to the 1,500,000 children of exceptional ability now in our schools. In them we see the greatest hope of leadership for the rest. The picture of national child life shown in this survey indicates that it is possible to make life better, healthier, happier, and richer for our children and for our Nation.

In the document known as *The Children's Charter*, the findings of the conference were summarized. The 19 points of the charter have in them the highest hopes of the nation for its children. There is not 1 of these 19 points that can not be put into effect in any part of the country if there is sufficient desire on the part of individuals or communities. We have been inclined to measure wealth by gold, oil, lumber, wheat, coal, and turning wheels. We now think of our children as our real source of wealth. Our educational system is to train each child so that he will have not only more satisfaction and happiness, but so that he will be a more productive element in society. The economic unit of the future is the human unit, not the dollar, nor the bale of cotton, nor the sack of wheat. The storing up and protection of wealth depends not upon strong-boxes, battleships, and bayonets, but upon properly prepared and trained children. *The Children's Charter* gives an index for such knowledge and such training. It indicates those new responsibilities of the home, the school, and the community which are to equip the child for such a world as it will have to meet. No one can foresee what two decades will bring forth in the way of new discoveries in science and in organization and of management, but we can all foresee that there will be no fundamental change in our physical and mental equipment. Only by the proper training of all of our children can we give reasonable insurance for the future of our Nation.

The Children's Charter lays out before us a definite goal which can not be achieved in any one day or year, or perhaps in any one

generation, but by keeping it constantly before us and by striving to meet the ideals and standards which it raises we can go far in preserving our children and in preparing them for the absorbing and complicated tasks of a civilization of great promise.

During the past year a whole series of regional follow-up conferences has been held; let us trust that this work will go forward.

THE CONFERENCE ON HOME BUILDING AND HOME OWNERSHIP

During the past year, for the first time in the history of the Nation, representatives of each of the many professional and commercial groups interested in one way or another in home building and home ownership have been assembled to pool their wisdom and work out cooperatively their common problems. The occasion was a conference on home building and home ownership, held under joint auspices of the Departments of Commerce and Interior, and representing more than a year of continuing work. If the eradication of slums and of similar blights on American living conditions is to be effected, this type of work must be of a continuing character. Committees of this conference brought forward certain simple and concrete proposals for every community. They involve such factors as the making of so-called master plans for city growth; zoning programs; design and construction; and financing. To this has now been added the President's great structure of the home-loan banks.

Public participation in slum eradication and legislation authorizing the exercise of the power of eminent domain for the demolition and rebuilding of certain areas was recommended by the conference. New systems of taxation were brought forward, relieving homes and dwellings from excessive assessments.

The President in his closing message to the members of this conference when they met in Washington said: "This housing war is not to stop until every American home is clean, convenient, wholesome, sanitary, and a fit place for a mother and father to bring to maturity young citizens who will keep our Nation strong, vigorous, and worthy."

THE GOVERNMENT AND THE COSTS OF MEDICAL CARE

For two or more decades there has been a steady growth in the public-health services on the North American continent. The present

self-analysis through which society is going permits a clearer evaluation of the benefits of modern medicine and public health than ever before. Out of the confusion is coming the beginning of a national strategy in the matter of public health. The progress goes forward with little publicity. The record is being written on the run. The combination of administrative ability, organizing capacity, and information that could be applied promptly has made such accomplishments as the maintenance of a pure water supply, the protection of a milk supply, and the prevention of disease seem almost commonplace.

Aside from the field of infectious diseases, the information in regard to nutrition and other work in the field of hygiene has been of great significance in the general health problem. The present world depression has disclosed the marvelous structure of care and of prevention which has been constructed by research workers, donors of funds, community chests, hospitals, social-service workers, public-health nurses, and others, all under the generalship of the trained doctor of medicine and doctor of public health.

The great problem of the cost of medical care brings more and more into focus the question of the Federal Government's relationship to medicine. One of the first suggestions brought forward is that the Federal Government should provide medical care to all citizens. In many parts of the world this is the answer that has been given. In this country the extension of Government medical service to veterans and their families and the care of **non-service-connected** disabilities has been a recent and a serious phenomenon. Nevertheless in spite of the vast concentrations of power and authority now in Washington and the growing and dangerous tendency of the people to turn to the Capitol for all necessary reforms, we have retained in America a healthy local responsibility and control over two important functions—education and medical service. In so far as these functions are supported by taxes, the funds are assessed, collected, and disbursed locally. With no central authority attempting to enforce uniformity of action upon all parts of the country, we can try out a great variety of plans. If State action is necessary, we have 48 laboratories in which to find out what action is most effective; if city or county action is called for, we have several thousand experiment

stations. We have no tradition that impels us to consider personal health matters as a Federal concern. We have no need of ever tying ourselves hard and fast to any one type of proposal. In health, as in education, we should keep sharply in focus the primary function of the Federal Government as one of research and the dissemination of information. Its function here is not administration.

INDIAN HEALTH

Health work among the Indians continues to improve. Trachoma, the peculiar curse of the Indian people, was combated by 38,504 examinations during 1932 as compared with 30,000 the year before.

About 4,200 patients were treated. A new hospital was completed and six more are under construction and nearly completed. As long as the Federal Government retains the responsibility for Indian health we shall insist on the best medical care which the appropriations of Congress make possible.

ST. ELIZABETHS HOSPITAL

St. Elizabeths Hospital is a Federal institution for the care of the insane. It is located in the District of Columbia and cares for patients of the Army, Navy, Marine Corps, certain other Government services, veterans, etc. At the end of the fiscal year it had 4,930 patients.

Here the Government has its most direct contact with the problem of mental hygiene. We have repeatedly urged a complete revision of the lunacy legislation in the District of Columbia. Bills are now pending to accomplish that result. The principal changes would be to permit volunteer commitment for treatment, relieving insane persons from trials comparable to criminal trials, and the substitution of determinations in the hospital, except where the insane person or his family demands a trial; a change in trial procedure to eliminate the stigma attached to an adjudication of lunacy; and more liberal provisions for release and automatic restoration of civil rights on certificates of cure.

During the past year the physical plant of the hospital has been improved. A new tuberculosis building housing 80 patients was completed, and contracts were let for additional buildings. An in-

teresting feature of the work is the effective cooperation given by the Red Cross in welfare work at the hospital and in maintaining contact between patients and their families.

NEGROES

The future of the negro in the United States rests entirely with the way in which some 4,000,000 negro children are brought up. Their health, education, and development are the responsibilities of our whole people, but in particular the responsibilities of the adult men and women of the Negro race. Within the last few years there has been a migration from the South to the North and West. This migration has been largely from rural to urban centers. Urban localities are peculiarly ill adapted to children, particularly those who have been raised in the open. The problem of the negro child in the less favored parts of industrial and metropolitan centers is one of great difficulty. Sunshine is his natural habitat. With the migration to urban centers in the North he faces a new set of conditions. The morbidity and mortality figures show that he is particularly susceptible to the two diseases that flourish best in the absence of sunshine. These are tuberculosis and rickets. Whatever else is done for the negro child he must be brought up under open-air conditions in so far as it is possible.

Because of the lowered economic level and various zoning questions, too many negroes, as has been shown by our housing conference, are forced into unsatisfactory houses and in the undesirable parts of many communities. Here, as in all forms of housing, there is need of the adoption of codes and their maintenance. In the geographical shift from agriculture to industry and from the open country to the city and its streets, the negro has suffered both in health and in other qualities.

FREEDMEN'S HOSPITAL

Freedmen's Hospital is⁷ an institution maintained in the District of Columbia for the care of negroes. It was founded to take care of refugees who had come to Washington in large numbers following the close of the Civil War.

During the past year its facilities were stretched past capacity; 4,928 indoor patients were under care during the year, an increase of

20 per cent over last year. Of these only 798 were paying patients. Outsidework cared for 9,616 patients, and the emergency department took care of 5,668. A total of 20,212 received some kind of benefit from the hospital.

POLICIES IN EDUCATION

We can keep democracy safe in the world by making the most of our opportunity to build in our schools strong, self-reliant, independent men and women united in sound small units of self-support and self-government. In this era of too rapid growth, of amalgamation, of centralized power, we must fight for safety through effective local government and local control. It is bad enough to have more people on the pay roll than on the land without making it worse by overcentralization in Washington. So complete is the mastery of the nervous system over our bodies that the prick of a knitting needle in one place in the upper spinal cord means death. We want no such mastery of our central government over the welfare of the people of a continent.

The American public-school system, local and self-governed, is one of the outstanding achievements of democracy. From fitful and scattered beginnings it has developed that firm structure upon which the stability of our country depends.

We have been building schoolhouses for a hundred years in every pioneer district. We built them out of the trees, rocks, bricks, adobe, or sod, in accordance with the handiest building material. Every community as soon as there were enough children in it managed to get together and hire a school-teacher to start on the process of training young Americans. These were the roots of our educational system and that system has grown great because these roots were nourished by their closeness to the people.

The training of the child is like sharpening a knife. If the material is good we can sharpen it, as well as we can, without any knowledge of what it is going to cut. Our training is to prepare it to cut right. We can not change the quality of the steel but we can give an edge appropriate to the quality of the steel so that it will do its work. All that a pupil has is his time. If we waste it in the school or elsewhere, we are wasting life. We must make the most of these lives, whether they be handicapped or competent, for each must live carrying along

a properly proportioned load if civilization and our democracy are to be a success.

What we do in our public schools with our children determines what our Nation shall be. In spite of temporary economic difficulties, it is no time for back-tracking in education.

In many ways our schools stand at the crossroads. We are in a period of retrenchment of public expenditures. The question of how to secure the greatest possible advantage to the commonwealth from every dollar going into education is being presented to every group having responsibility for the maintenance or administration of schools. At the same time education is starting to undergo a renaissance based upon the new needs of a society which has shifted from a largely agricultural base over to an industrial one. The training period of our youth must now be adjusted to a civilization in which science has become more decisive. A part of this renaissance is the conception that health, recreation and education are inseparable in the training of youth; and during the past four years we have endeavored to bring those factors into focus together, through the work of the White House Conference on Child Health and Protection, the National Advisory Committee on Illiteracy, and surveys of the Office of Education.

THE OFFICE OF EDUCATION

We have kept the Office of Education largely out of the field of administration. Its primary function is the finding out of facts about education and all its various phases throughout the States and foreign countries and the dissemination of such information in order to help the people in the States to establish more efficient school systems. Education is a local responsibility and must be kept so. The Federal Government's main function is assistance to the States in improving their own systems and not in dominating those systems.

The Office of Education operates on a small appropriation—\$572,000 for 1932. With that money it has done a good job. Education in general has been going through a rapidly developing emergency, not only on account of reduced State and local appropriations but of lack of confidence on the part of governing bodies and the public generally in the powers which have always been claimed for education in general. This stress is reflected in the increasing requests received here for information and fact-finding service. During the fiscal year

the office answered over 100,000 individual inquiries, issued 114 different publications, and distributed over 450,000 copies of such material.

It participated in research on a wide front. It completed four studies in public-school administration, including a study of the status of teachers and principals employed in rural schools. Improvement and progress in the education of rural children comes slowly unless we have sufficient facts upon which the educators may build and which can enable the public to understand the true need for funds and personnel. The office has published two curriculum guidebooks, one in safety education and one in science for the elementary school.

The Office of Education is the great clearing house of educational statistics for the country. The biennial reports of national statistics include one on personnel and finance of city schools, one of private schools, others on colleges, and a number in special fields. Its rural school studies show that 45 per cent of the high schools in the United States enroll 50 pupils or fewer, and that more than 80 per cent have an enrollment not exceeding 100 pupils.

In the field of school health other interesting studies have included a study of the relationship of physique and physical education to intelligence and scholarship, and a study of the posture of 9,000 elementary school children.

The office has participated in vocational guidance studies in cooperation with the National Vocational Guidance Association; it has embarked on a survey of educational tests and measurements; it has begun a series of studies on management of institutions of higher education, involving particularly problems of financing, curricula, and consolidation of institutions; furthering the work of the White House conference, it has published several bulletins on the education of exceptional children; it has carried on three major research projects in negro education, including a survey of secondary education, elementary rural schooling and a personnel survey of negro college students; a study in the education of children speaking foreign languages in some Southwestern States has opened up a new problem in American education. A continuous study of school-building problems is under way in cooperation with local school-building authorities. Several surveys have been made. The office has investigated particular problems of school administration at the request of such cities as Youngstown, Ohio. Problems of higher education have been studied at the request of North Carolina, South Carolina, Mississippi, and Virginia:

The Office of Education maintains one of the finest libraries on educational subjects in America, and assists local school libraries in improvement of their own material. It maintains a foreign school system department which is of invaluable assistance to American universities in evaluating foreign credentials and assisting foreign universities to evaluate ours. It handled 819 such requests last year and is publishing a series of monographs on education in foreign countries.

This past year, more than ever, educational opportunities have been needed for unemployed adults. In cooperation with the President's Organization for Unemployment Relief a report has been made of the extraordinary responsibilities now undertaken by schools in this phase of adult education. The war on adult illiteracy is being aided by this agency as well as by the many thousands of individuals co-operating in the work of the President's committee on illiteracy.

SCHOOL FINANCES

It is essential that a well based system of handling school finances be established so that the schools can be just as close to the established and permanent values as possible. Beginning two years ago, we undertook in the Office of Education a great survey of education and a great survey of school finances; the condition of the Treasury has made it necessary to suspend it for the time being. It is one of our most important long-time problems. It is essential that our State school systems do not go off onto transient forms of support. A gasoline tax can properly support roads and highways; but it will be unfortunate if school support comes from that source. Gasoline and highways automatically go together; land and landed property and home property naturally go with the schools. The experience of some of our States in relying upon oil royalties—which represent the consumption of capital—for the maintenance of their school systems, lies before us. Nevertheless it is apparent that the essential support of education and health can not be adequately given in many places under existing methods of taxation. A number of States require new constitutional provisions in order to meet present-day requirements.

ILLITERACY

A considerable number of those who came from the original native stock became isolated through war or economic necessity in the more

remote mountain regions of some of our States. There they and their descendants have remained, succeeding in the simple conquest of nature and in making a living, but without the privileges that come with the common school. Contact with them or their children of to-day indicates that their brain quality is just as good as that of their more literate neighbors. The human material is first class, but exposure to the process we know as education has been practically absent. The result is that we have islands where people are living on the basis of a century ago. They are not active contributors to our national life and have a minimum participation in it.

We have brought into being and action the National Advisory Committee on Illiteracy, dedicated to the restoration of these latent human assets, and to steady pressure in behalf of that other block of handicapped citizens, those whose old-world associations have insulated them from the current of our language and our educational system. There is no doubt that the task of education has on the whole been well carried out, but the 1930 census showed that illiteracy was prevalent in every State. There are large gaps in the working of our educational machinery. Certainly in the education of the Indians and in the education of the Filipinos the end result has not been all that could have been achieved.

In many centers of American life, in nearly every State, we have regional committees at work on these problems as a result of the studies of the National Advisory Committee on Illiteracy.

INDIAN EDUCATION

Specific progress during the past year includes the acceleration of a constructive Indian education policy. School attendance has been transferred to local day or public schools wherever possible. At the end of the year six more boarding schools had been closed or changed into day schools and two had been placed on the list to be closed at the end of the current year. The number of students in boarding schools, and particularly the number of small children, has been reduced. This program was begun several years ago. There were at the beginning of the present school year about 2,000 fewer Indian children in boarding schools than there were a year ago. The number of children in public schools had increased from 43,000 to 48,834; another 8,000 were in mission schools. In Government schools we

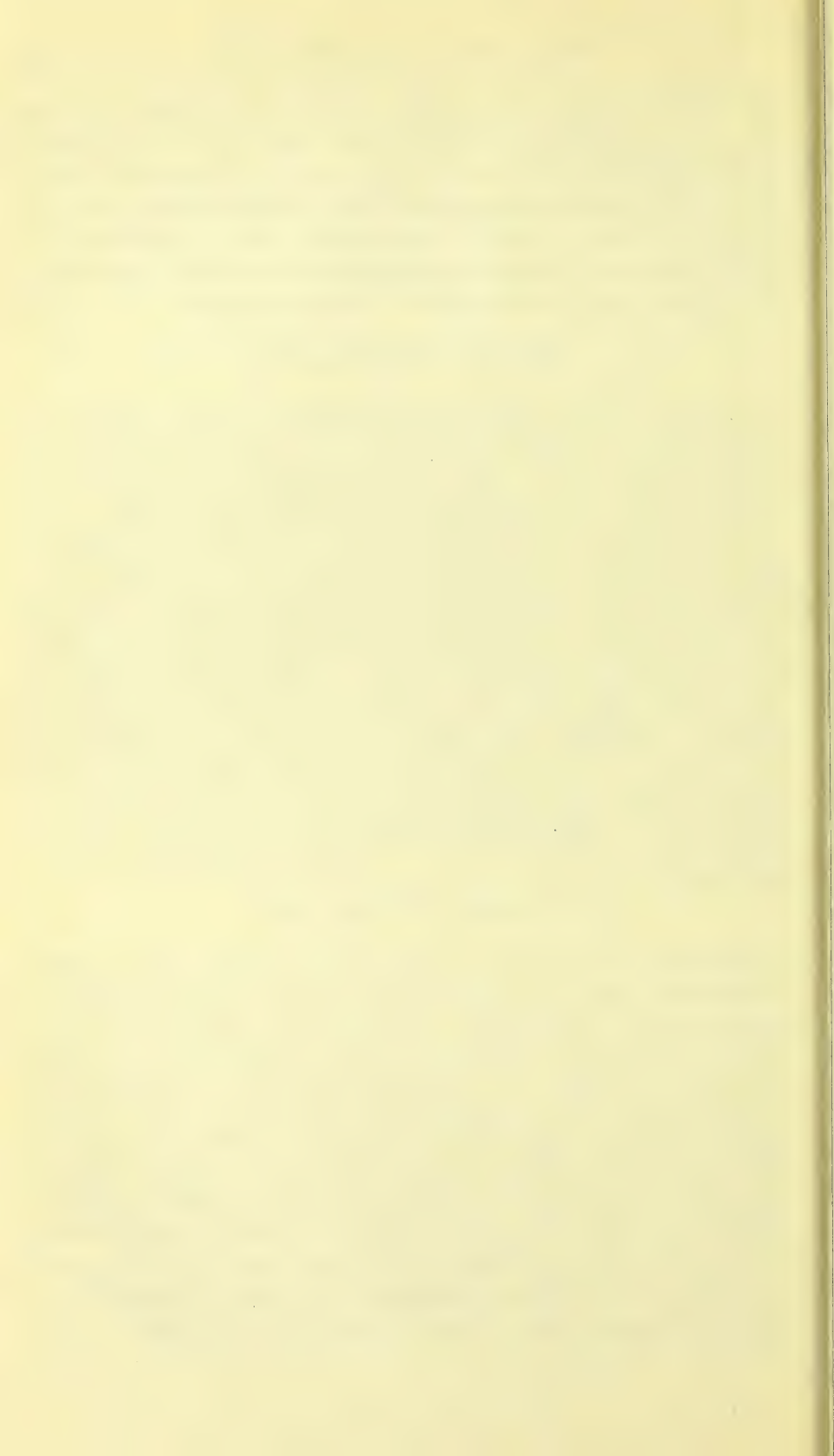
have 27,000 of which about 22,000 are in boarding schools. During the current school year we have contracts with 1,160 school districts as compared with 998 for the last year and 891 the year before that. In the field of higher education we are offering educational loans, room and board at Indian schools located close to universities in return for work, in some cases payment of tuition to State universities, and in other cases scholarships in advanced institutions.

HOWARD UNIVERSITY

Howard University, located in the District of Columbia, is a college for the higher education of negroes. Last year its enrollment was 2,464 from 42 States. Over recent years special efforts have been made to raise the number and qualifications of its faculty. Last year we reached a ratio of about 1 teacher to 12 students. Its law school was elected to membership in the Association of American Law Schools and there was increased interest in all branches of graduate study and research. Standards of admission to certain of its colleges were raised and its college of medicine was strengthened by five major appointments and increased cooperation between the college and Freedmen's Hospital. Its university consists of colleges of liberal arts, education, applied science, music, medicine, dentistry, pharmacy, law; and it maintains a graduate division and a summer school. It operates on a budget of about \$1,750,000 and has assets close to \$8,000,000.

COLUMBIA INSTITUTION

Columbia Institution for the Deaf is maintained by the Federal Government. Its advance department, known as Gallaudet College, last year furnished instruction to 148 students coming from 35 States. It is one of the few institutions of advanced education for those afflicted with deafness. The institution's primary department, known as Kendall School, furnished instruction to 64 students, most of them admitted from the District of Columbia. The steady growth of the institution has created a necessity for new buildings to relieve congestion. This school and Howard University represent the Government's two most direct ventures into direct education, and both of them are based upon exceptional and peculiar responsibilities, largely connected with Federal business administration of the District of Columbia.



Part III.—Administration: The Year's Work in Brief

The following are summaries of the reports of officers responsible to the Secretary of the Interior. These reports are printed separately.

The activities covered:

*The Solicitor's Office.
Board of Indian Commissioners.*

Bureaus:

*General Land Office.
Office of Indian Affairs.
Office of Education.
Geological Survey.
Bureau of Reclamation.
National Park Service.*

Territories:

*Territory of Alaska.
The Alaska Railroad.
Territory of Hawaii.
The Virgin Islands.*

Institutions:

*St. Elizabeths Hospital.
Freedmen's Hospital.
Howard University.
Columbia Institution for the Deaf.*

Extra-Departmental Activities:

*American Antiquities.
General Education Board.
Fuel Administration; Coal Commission
Perry's Victory Memorial Commission.*

THE SOLICITOR

SUMMARY OF REPORT

During the year the solicitor's office presented 37 oral arguments to the courts of the District of Columbia and filed 46 briefs in the submission of cases for decision and in hearings on various motions.

The two test cases brought to determine legal questions arising under the act of March 2, 1919, commonly known as the war minerals act, and mentioned in the last annual report, were decided by the Supreme Court of the United States December 7, 1931. This decision has been followed in the disposition of pending cases and thereunder approximately one-third of the 346 suits brought pursuant to the act of February 13, 1929, have been disposed of. Seventeen other test cases brought under the act last mentioned are now under consideration by the courts of the District of Columbia, which suits, when finally determined, will dispose of many of the remaining cases. Separate trials will only be required in those cases which involve questions peculiar to the respective claim or claims. One hundred and three war minerals suits have been finally closed in the courts by decrees or dismissals. Fourteen miscellaneous cases, involving Indian, reclamation, and public land questions, have been finally closed.

All cases involving oil conservation matters pending at the date of the last report have been finally closed on the court dockets in favor of the Government. There were 284 cases in this class.

There remained at the close of the year 248 suits on the dockets of the Supreme Court of the District of Columbia, and 3 cases on the docket of the Court of Appeals.

New or additional legal work has devolved on the solicitor's office during the past year as a result of the transfer to the jurisdiction of the Interior Department of the Virgin Islands and the Alaskan Road Commission. Decisions by the courts in war minerals cases hereinbefore referred to have resulted in the reopening and reconsideration of a substantial number of these claims. The solicitor's office has assumed the legal work incident to the adjudication and disposition of these cases by the Secretary of the Interior and the War Minerals Relief Commission. Sixty-two of these cases were reviewed during the past year. There was a decrease in the number of Indian matters reviewed by the solicitor's office during the past year because of change in practice which permitted final disposition of some minor matters in the field. There was an increase of about 25 per cent in opinions rendered by the solicitor, and an increase of nearly 300 per cent in reports on legislation reviewed, written, or considered.

Throughout the year the office cooperated with the Department of Justice and other departments in matters of common interest affecting the United States, and has in many instances given oral advice and counsel to department officials and others in matters involving affairs within the jurisdiction of the Department of the Interior. Considerable work has also been performed for the Federal Oil Conservation Board in compilation and review work and also in other miscellaneous matters.

The solicitor is a member of the departmental oil committee which reviews all applications for oil permit extensions, leases, and miscellaneous matters relating to oil. The issuance of departmental instructions of April 4, 1932, reopening the public lands to the filing of prospecting permits for oil and gas subject to the express agreement of all permittees to join in unit or cooperative plans of development and to hold their permits subject to the provisions of the act of Congress of March 4, 1931, has resulted in the filing of a substantial number of new permit applications.

The following table shows a portion of the work performed by the office:

	Public-land matters		Indian matters	Miscellaneous matters
	Appeals	Motions		
Pending July 1, 1931.....	727	13	18	20
Received during year.....	761	160	11,749	9,370
Total.....	1,488	173	11,767	9,390
Disposed of during year.....	1,268	164	11,753	9,373
Pending June 30, 1932.....	220	9	9	17

“Miscellaneous matters” include the following:

Formal opinions by the solicitor.....	106
Reports on legislation.....	917
Contracts for the erection of buildings, for building of roads, for supplies, etc.....	1, 460
Cases prepared for submission to the Board of Equitable Adjudication...	1, 128
Oil and gas matters:	
Leases.....	106
Prospecting permits—	
Reinstated.....	49
Granted.....	43
Assignments.....	178
Extensions of time.....	2, 082
Canceled.....	1, 060
Coal matters:	
Prospecting permits.....	81
Licenses.....	46
Leases.....	33
Potash matters:	
Leases.....	3
Prospecting permits.....	102

BOARD OF INDIAN COMMISSIONERS

SUMMARY OF THE REPORT OF THE BOARD (A BODY NOT AFFILIATED WITH THE INDIAN SERVICE, ACTING IN AN ADVISORY CAPACITY)

The Sixty-third Annual Report of the Board of Indian Commissioners to the Secretary of the Interior shows that during the year members of the board visited schools, agencies, and other branches of the Indian Service in 17 different States. According to the report the Indian Service passed through unusual conditions during the year. Like their white neighbors, the Indians were brought face to face with many disturbing and perplexing problems. Unfavorable economic conditions were aggravated in some parts of the West by bad weather which resulted in serious crop and livestock losses and suffering to many people.

The report states that the serious situation confronting the Indian Service calls for the active cooperation of every one who has an active interest in the advancement of the Indian people. The need of the hour is a hearty working together by all organizations and individuals to do everything possible to help the Indian and those working for him and with him in order that there shall be no slackening of progress while we await the return of better times. Within the service itself there is imperative need for closer coordination of all the activities directed toward the uplift of the Indian people. Because of the shortage of funds and a reduced field personnel, technicalities should be brushed aside and the spirit of teamwork given the greatest emphasis.

In commenting on the measures for granting relief to needy Indians during the year the report states the following:

In order not to give encouragement to the idea that the Indian is under no obligation to support himself as long as the Government is willing to supply food and clothing, the Indian Service, in furnishing relief to the needy and also in the case of part of the Red Cross issues, required all able-bodied Indians to perform some useful labor in return for the assistance received, whenever it was at all practicable. The demoralizing influences of the old ration system and the distribution of per capita payments are well known. Even in times of distress there should be no let-up in the policy of impressing upon every Indian the necessity for maintaining himself and family by his own labors.

In its report, the board renews its recommendation for the adoption of a policy of decentralization of authority by giving more discretion to the field superintendents and reducing the handling of detailed matters of the Indian Service in Washington. Orders issued from time to time have given the superintendents in the

field more authority within certain limits but the recent reorganization of the Indian Service has resulted in some progress in the wrong direction. The various specialized branches of the service are now in charge of staff officers who have administrative direction over their particular line of work in the field and representatives of the specialized services are stationed at the various field units. The effect has been that authority of field jurisdictions has gravitated toward the officers of these special branches or divisions and away from the superintendent. As stated by Commissioner Scott, a member of the board, "practical decentralization has not been effectuated so as to reach the superintendent, the man who is always in contact with the Indians, whose initiative has been further weakened and whose whole administration has been cramped down tighter than ever. He is held responsible for results without the necessary power to secure them."

The board urges that appointees to positions in the schools and other parts of the Indian Service be persons who have had experience in Indian work, whenever it is possible to obtain them. The comments on this subject are as follows:

We are in hearty sympathy with the efforts that have been made to raise the standards of the Indian school, but our observations have led us to believe that in making appointments too much emphasis has been placed upon academic qualifications rather than upon character, common sense, and practical experience in dealing with Indians. We disapprove the practice of appointing new, untried, and inexperienced persons to key positions instead of promoting those who have already demonstrated their efficiency by good service in less important posts. The principle of promotion is an elementary and basic feature of all good administration. To deny recognition and promotion, or the expectation of it, to those who have worked up through the service by merit and demonstrated efficiency, and to appoint instead persons with no knowledge of Indian history and temperament and the elementary principles of the Federal administration of Indian affairs is a mistake for which one finds little justification. We believe it is possible to give more recognition to those who have acquired valuable experience in the service without in any way excluding the wealth of ability and training that is now available outside of the Indian Service.

The board recommends the enactment of legislation by Congress which will specifically define an Indian. In years past, according to its report, persons of varying degree of Indian blood have been enrolled and become entitled to a share in the property and rights of different tribes. As long as a person has shown an appreciable amount of Indian blood, no matter how small the percentage may have been, the Bureau of Indian Affairs has enrolled him and granted him all the rights of full tribal membership, if entitled thereto under existing law. Thousands of persons, more white than Indian and often with but a trace of Indian blood, have thus received rights which entitled them to shares in tribal estates and other benefits as Indians and wards of the Federal Government. Although a large part of the Indians have been enrolled and considerable areas of their land have been allotted

it is recommended that Congress pass legislation so that no person of less than one-fourth degree of Indian blood shall be enrolled and become entitled to tribal rights in the future.

The board also recommends legislation to bring about better law enforcement on Indian reservations. It urges the passage of a simple act extending the jurisdiction of State laws over Indian reservations, but where the aboriginal life is still primitive and it is not considered that there exists a sufficient comprehension among the Indians of the laws and customs of the white people the Secretary of the Interior should be given the authority to decide whether the laws of the State should be put into effect or not.

In its observations on the desirability of the conservation of tribal funds the board states that it is opposed in principle to the making of per capita payments to the members of Indian tribes. In periods of great distress, as has occurred in the past year throughout parts of the Indian country, there is some justification for drawing on the tribal funds to relieve pressing need for food and clothing, but in normal times the board believes such payments should not be made from Indian funds. The report states that tribal moneys should be conserved and used only for productive purposes; per capita payments usually mean a gradual depletion of the tribal estate without worthwhile benefits to the Indians. The anticipation of these payments tend to hinder economic progress, for the expectation of receiving money without necessity of performing labor in return encourages indolence and deadens initiative. Congress, the Indian Service, and all disinterested friends of the Indian people should take a firm stand in opposition to the continuation of this undesirable practice which is harmful to the individual Indian and tends to fritter away funds which should be used for more beneficial purposes.

In the report the board advises caution in the carrying out of plans to close Indian Service boarding schools in the following paragraph:

The policy of placing a large part of the Indian children in local schools near their homes rather than giving them institutional training in boarding schools, at least in the elementary grades, is an educational development which we in principle indorse. It has been the announced policy of the education division to study carefully each existing boarding-school situation to determine whether the school is one that should be closed down, continued for some other purpose, or maintained indefinitely. As a result of those studies several schools have been closed during the past year. We urge that in carrying out this policy due caution be exercised. We warn against the premature or precipitate closing of boarding schools before definite information is at hand to determine where the pupils, if transferred, are to be placed and whether such transfers will be for the best interests of all concerned. We believe that there is still a place in the Indian Service system for boarding schools giving both elementary and intermediate instruction. There will always be a need for taking care of orphans, the children from broken homes, those living in districts remote from public schools, and those coming from small Indian groups still too nomadic in life to make day-school attendance practicable.

THE BUREAU

GENERAL LAND OFFICE

SUMMARY OF THE COMMISSIONER'S REPORT

New public entries.

The area embraced in original entries and selections for the fiscal year 1932 exceeded the annual average for the past 10 years by more than 50,000 acres. The homestead laws retained their usual leadership. They accounted for almost 90 per cent of the new segregations and more than 75 per cent of the areas patented.

Arrearages.

The additional appropriations made available for the year 1932 enabled the commissioner to reduce the arrearages in the General Land Office to a minimum, and while there was no appreciable difference in the number of field cases received there was a gain of nearly 7,000 in investigations and final adjudications.

Receipts and expenditures.

Disposition of public lands through sales, leases, and otherwise resulted in cash receipts of \$4,065,210.76 and the proceeds from Indian lands, \$63,874.01, an aggregate of \$4,129,084.77, all of which was deposited in the Treasury. Bonuses, royalties, and rentals secured from leasing and mineral rights on the public domain total \$3,236,978.35. The State of Wyoming continued in the lead with \$1,435,109.81; California was a close second with \$1,402,264.05. Receipts from other States were New Mexico, \$118,108.42; Utah, \$84,545.04; Colorado, \$70,023.06; Montana, \$69,098.81; North Dakota, \$23,871.41; Washington, \$11,924.45; Alabama, \$8,982.20; Louisiana, \$5,577.62; Idaho, \$4,833.97; Nevada, \$2,255.71; South Dakota, \$362.16; and Michigan, \$21. These figures do not include \$20,732.85 received as royalties in the State of Wyoming under the act of June 26, 1926, of which the State does not receive a share, nor \$4,523.25 received as royalties on coal leases in Alaska of which the Territory receives no part. Under the provisions of the mineral leasing act of February 25, 1920 (41 Stat. 437), the State within which the lands are situated receives 37½ per cent of the receipts, bonuses, rentals, and royalties, the reclamation fund 52½ per cent, and the other 10 per cent remains in the Treasury. The reclamation fund will receive \$2,100,555.87, the States within which the lands are located

\$1,402,420.93, the various Indian tribes, \$63,874.01, and there will remain in the general fund, United States Treasury, \$562,233.96.

There was expended in the conduct of business of the General Land Office \$2,204,224.16, and disbursed from deposits by individuals for surveying, etc., an additional amount of \$19,503.95, and from appropriations for surveying Indian reservations, \$47,432.60.

Acres entered and patented.

Original entries allowed covered 4,551,774 acres, not including 53,102 acres embraced in finals not theretofore counted as original disposition of land. The area included in original patents was 1,897,978 acres, of which 1,120,332 acres were patented with all minerals reserved. The acres included in homestead patents numbered 1,438,075. Among other patents were 49,613 acres in Indian fee, 2,865 acres in timber sales, Oregon, and 92,144 acres of reissues.

Field service.

The appropriation for this service was \$485,000. Of this sum, \$60,000 was set apart for prevention and suppression of forest and other fires on the public lands, leaving \$425,000 for the prosecution of routine work. Due to the activities of field investigations \$88,954.35 was collected and turned into the Treasury and 107,270.92 acres were restored to the public domain, representing fraudulent entries canceled on field service proceedings. There were pending field investigations on July 1, 1931, 17,246 cases, 20,455 new cases were received, 26,695 were investigated, reported and closed, leaving only 11,006 at the close of the year. Of the 26,695 reports submitted, 7,673 were adverse and 19,022 favorable. The recommendations of this department resulted in 44 civil suits brought by the Department of Justice; 32 of these cases were tried, 29 won and 3 lost. Owing to the exceptionally heavy forest fires during the summer and fall of 1931 the special appropriation of \$60,000 for prevention and suppression was inadequate, and it was found necessary to invade the general fund for protection of public lands by an additional \$6,000.

Cadastral engineering service.

The cadastral engineering operations under the administrative control of the Commissioner of the General Land Office are conducted in the field by the supervisor of surveys with headquarters at Denver, Colo. A field office under the associate supervisor is located in the General Land Office. There were 12 public survey offices maintained during the year at the following places: Helena, Mont.; Cheyenne, Wyo.; Denver, Colo.; Santa Fe, N. Mex.; Phoenix, Ariz.; San Francisco, Calif.; Reno, Nev.; Salt Lake City, Utah; Boise, Idaho; Olympia, Wash.; Portland, Oreg.; and Juneau, Alaska. The office at San Francisco was transferred to Glendale, Calif., on June 30, 1932. Direct appropriations for the support of this service were

\$700,000, and this amount was augmented from other sources by \$63,271.52. Cadastral surveys were carried on in 23 States and the Territory of Alaska under 224 groups of which 85 in 20 States were of resurveys. That part of the work computable on a line basis amounted to 17,803 linear miles. For the execution of this work the average cost was \$18.32 a mile. Public survey lines were extended over 2,027,000 acres of agricultural lands. The larger fields of operations were in the States of Arizona, Nevada, New Mexico, and Utah. There are many governmental agencies whose activities are based on or are directly related to the public lands and they are dependent upon the cadastral service of the General Land Office for geographical position and description. Approximately 800,000 acres were surveyed in cooperation with the Department of Agriculture. Other departments for which surveying work was done under cooperative arrangements were War, Navy, Treasury, Commerce, Federal Power Commission, Coast and Geodetic Survey, as well as other bureaus of the Interior Department. Original field work in the various classes of surveys measurable on an area basis totaled 2,967,000 acres and the quantity resurveyed, 1,165,800 acres. The commissioner accepted and placed on file plats representing 1,598,220 acres of original surveys of public lands and 768,093 acres of resurveys, comprising an aggregate of 2,366,313 acres.

Cartographic engineering service.

The 1931 edition of the map of the United States has been prepared and is now being distributed. New maps of Wisconsin and Wyoming have also been issued and those of the States of Idaho and Oregon are in the office of the contractor for printing. Work is progressing upon the recompilation of the maps of the States of Arizona and Colorado and preliminary work has been undertaken for a new map of the Territory of Alaska. Preparation was continued of numerous maps for the use of the Department of Justice in connection with suits brought by various Indian tribes for lands for which the Indians claim they have never been compensated. New maps were supplied the Department of Justice showing land grants of the Northern Pacific Railway for use in the case of *United States v. Northern Pacific Railway Co. et al*, now pending in the courts. Photolithographic copies of township plats to the number of 5,697 were furnished other departments for official use and 7,991 such copies were sold for which \$4,048.50 was received. Two hundred sixty-one thousand six hundred and seventy-nine circulars covering the various public land laws and the regulations thereunder were distributed, 2,303 maps mounted, and 3,414 map publications furnished.

Homestead and associated entries.

Homestead entries under the various public land laws were allowed as follows: The general provisions of section 2289, R. S., title 43,

chapter 7, section 161, U. S. C., 2,942 for 303,545 acres; enlarged, act of February 19, 1909 (35 Stat. 639), title 43, chapter 7, section 218, U. S. C., 772 for 202,727 acres; stockraising, act of December 29, 1916 (39 Stat. 862), title 43, chapter 7, section 291, U. S. C., 7,291 for 3,543,582 acres, a total of 11,005 entries for 4,049,854 acres. There were brought over from last year 2,359 cases involving homestead and other associated applications, 38,088 were received. Disposition was made of 35,531 and those not reached for action, 4,916. The approvals for patent included 5,639 homestead entries. Consideration was also given to 1,837 applications to make second homestead entry, 802 applications to amend, 1,008 applications for leave of absence, and for extensions of time to establish residence, 8,033 original entries and 14,875 appeals from actions of district land offices and this office. Isolated tracts, or public sale applications under section 2455, R. S., as amended, were 1,089 and of these 286 sales were approved for patenting. Ninety timber and stone entries were passed to patent out of total of 324 receiving action. Answers were given to 65,667 letters relating to homestead matters. Instructions were issued involving the filing of 270 township plats.

Restorations and openings subject to the preference right of ex-service men.

Pursuant to the provisions of joint resolution approved June 12, 1930 (46 Stat. 580), extending preference to ex-service men, public lands were restored from withdrawals to the extent of 3,578,768 acres and 809,664 acres became subject to entry through the approval of new surveys.

Minerals and mining claims.

There were awaiting action at the beginning of the fiscal year 26 oil and gas relief and lease applications under sections 14, 18, 18a, 19, and 22, act of February 25, 1920 (41 Stat. 437). One thousand two hundred and nine cases were received, and 53 leases involving 37 cases were granted. Section 14 of the general leasing act awards the discoverer of oil and gas proceeding under a prospecting permit a preference right to a lease. Twenty-four thousand six hundred and four and seventy-four hundredths acres were embraced in 44 leases under the foregoing authority. Public sale provisions of the leasing act resulted in the issuance of leases for lands in the Virgin oil field, Utah, Kirby oil field, Wyoming, Artesia oil field, New Mexico, and the Kevin-Sunburst and Buffalo Basin fields, Montana. Such leases, 9 in number, involved 4,676 acres, from which bonus payments of \$68,002.75 were received. Canceled in their entirety were 11 leases affecting 9 cases, while 16 leases covering 14 cases were canceled in part. One thousand one hundred and fifty other actions were taken and only 21 cases awaited consideration at the close of the year.

Oil and gas—Cooperative and unit plan of development.

Pursuant to the act of March 4, 1931 (46 Stat. 1523), the Secretary on February 11, 1932, approved operating agreements submitted by the Mountain Fuel Supply Co., covering plan of development of gas to be supplied through a pipe-line system to towns in Colorado, Wyoming, and Utah, including Ogden and Salt Lake City, Utah. The plan as at present outlined covers 46 permits and leases and anticipates an ultimate expenditure of approximately \$33,000,000. Under the same act there were approved with the cooperation of lessees and permittees unit plans of operation on three geologic structures in Wyoming, namely, Little Buffalo Basin field, Big Draw gas field, and Baily Creek gas field.

Oil and gas permits.

Based upon applications filed prior to the order of March 13, 1929, 43 permits were granted, 11 applications for permits, and 38 permits which had been canceled were reinstated. Final action was taken on 55 applications, 178 assignments were considered, and 249 applications for extension of time were disposed of. The order of March 13, 1929, was on April 4, 1932, modified by the Secretary of the Interior and under appropriate regulations the public domain was again opened to the filing of applications for prospecting permits under section 13 of the leasing act and subsequent legislation providing for unit development. Seventeen hundred and ten applications for permits were filed under the modified regulations. Action was taken on 7,110 permits, leaving 2,239, including those recently filed under the amended regulations of April 4, 1932.

Mineral entries.

Brought over from last year were 155 mineral entries and 694 were received, 786 were adjudicated, leaving 63 on hand. Two hundred and eighty-two were patented. July 1, 1931, 32 mineral applications were pending, 132 received, 157 disposed of, only 7 await action.

Miscellaneous mineral cases.

There were in the office at the beginning of the year 108 miscellaneous mineral cases, 673 were received, 700 decided, and 81 were not reached for action.

Coal.

Fifty-four applications for coal permits were pending at the beginning of the year, 2,199 were received, 81 coal permits were issued for an area of 71,055.67 acres, 33 coal leases were made covering 3,330.72 acres, and 46 coal licenses were given for 1,747.93 acres. The total number of coal cases adjudicated was 2,153; 100 remain.

Potash.

Potash leases in three cases involving 6,808.59 acres were granted, and 162 potash permits for an acreage of 218,938.73 were issued under the act of February 25, 1920, as amended by the act of December 11, 1928.

Sodium.

Disposition was made of 880 of the 950 sodium cases before the office.

Oil shale, Hoover Dam and San Gabriel mining claims.

Fifty-four reports on oil shale locations not embraced in patent proceedings failed to receive action during 1931; 1,367 such reports were received. Judgments were rendered affecting 1,372 and 49 were left over. Charges were preferred against 14,395 locations embracing approximately 1,713,000 acres. Undecided at the beginning of the year were 103 oil-shale contests, to which number was added 1,794 new cases. Decisions were rendered in 1,777, leaving 120 pending. Locations numbering 10,918 for 1,294,500 acres were declared null and void. There were on hand at the beginning of the year 24 oil-shale applications for 186 claims, affecting 29,932 acres. A claim embracing 160 acres was received; 7 applications for 29 claims with an acreage of 5,592, were rejected, and 4, including 34 claims for 5,321 acres, were passed to entry, leaving for consideration 14 applications covering 124 claims with an acreage of 19,179; 42 oil-shale entries, including 270 claims for 38,416 acres, were pending July 1, 1931; 4 entries for 34 claims covering 5,321 acres, were received. Approved for patenting were 23 entries for 139 claims with an acreage of 23,489.17; 23 entries including 165 claims for 20,248 acres were not reached. The creation of the Federal reservation in Nevada in connection with the Hoover Dam and reservoir project added considerably to the area to be examined and 630 additional field reports were submitted. These together with 43 on hand total 673; 648 received action, leaving 25. Five Hoover Dam reservoir contests were brought over from last year. Four hundred and thirty-six were received, 428 were adjudicated, involving 1,017 locations. Mining claims in the San Gabriel Canyon in conflict with rights of way of the cities of Los Angeles and Pasadena, Calif., for reservoir purposes in connection with their water supplies have interfered and retarded the construction of necessary dams. It became necessary to cause an examination to be made of such claims to determine their validity in order that unlawful ones situated in the area desired for construction purposes might be declared null and forfeited. Examination on the ground by representatives of the land office resulted in reports that 246 locations were invalid and proceedings were instituted against them; 163 have been declared of no effect, 145 were finally disposed

of, leaving 83, against which adverse proceedings are now pending. The investigations were not completed and considerable field work is necessary.

Contest expenses.

To effect legal service on numerous persons found from examination of records to hold rights under various claims situated in both the Hoover Dam and the San Gabriel Canyon regions, it was necessary to publish notice of adverse proceedings in many cases. The publication of such notices added materially to the expense of the proceedings.

Leases.

The devotion of public lands for aviation fields through leasing was authorized by the act of May 24, 1928 (45 Stat. 728); 82 claims presented under this act were considered, 2 leases were canceled, 3 applications finally rejected and closed, 1 extension of time was granted on a lease for compliance with the terms thereof, and 7 applications for leases await the revocation of the withdrawals involving the lands applied for. Leases were granted to the town of Saguache Colo., for 555.25 acres, and to Anchorage, Alaska, for 140.24 acres. Scattered tracts between the cities of Tucson, Ariz., and Los Angeles, Calif., embracing 1,600 acres of public lands, were withdrawn for landing fields and other aviation purposes. Similar areas of public lands aggregating 2,552 acres in Arizona, California, Nevada, Oregon, Utah, and Wyoming were withdrawn for use as intermediate landing fields and the maintenance of air navigation facilities, and 1,025 acres were released from withdrawal.

Fur farming.

The public lands within the States are not subject to lease for fur-farming purposes, but by the act of June 3, 1926 (44 Stat. 821), leases on public lands in the Territory of Alaska may be made for fur farming, 221 cases were considered under this act, 77 leases were issued, 5 were canceled, the assignment of 1 approved, and 5 were authorized, awaiting execution by the applicants, 24 applications were finally rejected and closed.

Stock grazing.

Leases may be issued in the Territory of Alaska for stock grazing purposes pursuant to the provisions of the act of March 4, 1927 (44 Stat. 1452); 113 cases relating to stock grazing matters in Alaska received action, 5 leases were issued, 5 authorized, 1 extension of time permitted for compliance with the terms of the lease, and 16 applications were finally rejected and closed. The remaining cases await report from the field. An association of stockmen was organized in the Mizpah and Pumpkin Creek regions, Montana, for the purpose of entering into an operative agreement affecting the leasing of public

lands for stock grazing purposes; pursuant to the provisions of the act of March 29, 1928 (45 Stat. 380), a lease was issued to the said association on May 9, 1932, for approximately 25,124 acres, at a yearly rental of \$785. The use of the lands withdrawn by the act of March 4, 1931 (46 Stat. 1530), for stock grazing purposes was approved by the Secretary of the Interior, as authorized by section 2 of the act; 58 applications for grazing permits were filed under the act, 32 were granted, 3 rejected, and the remainder was suspended awaiting further field investigations.

State, county, or city recreational areas.

Petitions presented by 4 States and 1 county resulted in 5 withdrawals for recreational classifications under the act of June 14, 1926 (44 Stat. 741); 822 acres including 200 revested Oregon & California Railroad lands were included within such withdrawals. Sale of 200 acres under the reclamation law was made to Marion County, Oreg., 200 to the city of Cheyenne, Wyo., and 170 to the State of California. A lease was issued to the State of Oregon for 206 acres.

Stock driveways.

Section 10 of the act of December 29, 1916 (39 Stat. 862), as amended by the act of January 29, 1929 (45 Stat. 1144), was the authority for 9 new stock-driveway withdrawals, and pursuant to the same provisions 31 driveways previously established were modified and 1 revoked. The area withdrawn was 84,980 acres, and that released from such withdrawals, 7,595 acres. There were embraced within the exterior limits of such withdrawals at the close of the fiscal year, 9,535,955 acres distributed among the States as follows: Colorado, 217,099; Idaho, 822,797; Montana, 234,008; Nevada, 3,567,052; New Mexico, 1,102,084; Oregon, 456,465; South Dakota, 22,155; Utah, 1,254,960; Washington, 10,919; and Wyoming, 1,311,087 acres.

National forests.

Changes in forest boundaries under the act of June 4, 1897 (30 Stat. 34-36), were as follows: 8 were reduced, 5 abolished, and 15 interforest transfers effected. Two forests were enlarged and one reduced by special acts of Congress; the areas in 15 were increased under the national forest consolidation act of March 20, 1922 (42 Stat. 463). Recomputation of the areas of certain national forests due to recent surveys decreased the areas theretofore reported by 122,457 acres. The changes made included a gross addition of 1,434,670 acres, and an exclusion of 470,996 acres from forest boundaries. Two forests were created and two enlarged under the so-called Weeks Act of March 1, 1911 (36 Stat. 961). The area now within existing forests under such act is 478,053 acres. Now embraced within the outer limits of national forests are 186,215,256 acres, of

which a little over 86 per cent is owned by the Federal Government. There are now withdrawn 169,744 acres as administrative sites.

Indians and Indian lands.

Applications for fee or trust patents for the benefit of Indians were examined in 3,295 cases, and 710 fee and 1,555 trust patents were issued. The adjudication of 467 cases under section 4 of the act of February 8, 1887 (24 Stat. 388), as amended, allowing allotments to Indians not residing upon a reservation, resulted in the issuance of 26 patents. Quieting title to lands within Pueblo Indian grants in New Mexico was provided by the act of June 7, 1924 (43 Stat. 636). There were 329 non-Indian land cases adjusted under such act and 265 patents granted.

Ceded Indian lands.

The general repeal of the preemption laws by the act of March 3, 1891, did not affect certain ceded Indian lands. Preemption claims were considered in 47 instances involving such lands and 3 patents were granted. There were 2,441 cases involving ceded Indian lands upon which action was taken resulting in 25 patents for homesteads and 97 for sales of such ceded lands.

Court of Claims data respecting pending Indian claims.

The compilation of data concerning claims to Indian lands involved in suits before the Court of Claims is progressing as rapidly as the intricacies of the work will permit.

Contests, miscellaneous.

Awaiting action at the beginning of the year were 412 miscellaneous contests. Those received numbered 1,844. Judgments were rendered in 1,714, leaving without consideration 542. This group includes all contests both Government and private involving claims to public lands except those affecting minerals or mining claims or land situated in the Hoover Dam project or the San Gabriel Canyon, Calif.

Mineral contests.

One hundred and twenty-one contests affecting mineral lands generally were added to the 62 awaiting action. Decisions were rendered in 129 cases and 54 were not reached.

Oil-shale contests.

Left over from last year were 103 oil-shale contests; 1,794 were received, 1,777 decided, and 120 not considered.

Hoover Dam project contests.

Four hundred and twenty-eight of the cases before the office were disposed of and 13 not reached for action.

San Gabriel Canyon contests.

Proceedings were instituted against 246 claims in the San Gabriel Canyon, Calif. Disposition was made of 163 of these claims and 83 were not reached. In all, 4,211 contest cases were decided and 812 await consideration.

Rights of way.

Railroad rights of way applications to the number of 116 were received which, added to the 5 pending, made a total of 121. Twenty-six were approved and requirements made in 81; not adjusted, 14. Seventy-two reservoir declaratory statement applications were presented, requirements were made in 8, 59 were disposed of, and 5 not reached for action. Irrigation, telegraph, telephone, public road, pipe line applications numbering 623 were received. Seven were brought over from last year, 151 were approved, 27 canceled, 81 otherwise disposed of, and requirements made in 358; 13 were not considered. One hundred and fifty-six maps for approved rights of way in forest and Indian reservations were received from the Forest Service and Indian Office and approvals promulgated. Thirty memoranda or opinions were submitted to the department on rights of way matters referred to the Land Office for consideration. The number of approved rights of way awaiting action July 1, 1931, was 55; those received were 718. Of these, proof of construction was accepted on 43. There were canceled, by relinquishment or default, 84. Requirements were made in 462 and 169 were otherwise finally disposed of. Six suits were recommended and 10 decrees of forfeiture obtained as result of previous recommendations. Twenty-seven suits are now pending in the Department of Justice.

Hydroelectric power.

One hundred and six restorations in accordance with the terms and conditions of section 24 of the Federal water-power act were promulgated; 54 hydroelectric power project applications were transmitted to the General Land Office by the Federal Water Power Commission involving public lands and lands within national forests in 12 States and in the Territory of Alaska; 19,050 acres were withdrawn under the Federal water-power act. Previous withdrawals for like purposes total 2,100,520 acres.

Reclamation.

Water-users associations and irrigation districts operate either in whole or in part 19 Federal reclamation projects. There are 31 such Federal projects and in addition 5 Indian reclamation projects; 2,242 entries of various kinds in reclamation projects were received, and 1,953 adjudicated. There were promulgated 29 orders of restoration and 11 orders of withdrawal under the reclamation act. The area restored in the various States totals 3,399,400 acres, while that

withdrawn amounts to 1,250,640 acres. There were 6 openings to entry subject to the reclamation act of a total of 140 irrigated farm units located in the Klamath, Minidoka, Belle Fourche, Vale, Riverton, and Sun River districts.

State irrigation districts, acts of August 11, 1916, and May 15, 1922.

Seventy-nine applications by districts for approval under the act of August 11, 1916, have been received at various dates in the General Land Office. During the fiscal year 1932, 1 application involving 9,605.29 acres was approved and 1 for 27,665 acres rejected. In all, a total of 59 applications involving 2,441,863.69 acres have been approved and 17 for 351,073.09 acres have been rejected. Three applications are now pending. Four contracts under the act of May 15, 1922, were promulgated.

Private irrigation projects.

Four private irrigation companies were approved as dependable sources of water supply for desert-land entries, 8 new cases were presented, 13 formerly approved were reopened, 5 were rejected, and 24 are now pending. Since the adoption of the regulations of September 30, 1910 (39 L. D. 261), 1,418 projects have come before the Land Office on reports from field representatives.

Desert land.

Two thousand six hundred and forty-four cases under the desert land laws were received and 86 were pending. The approvals numbered 359, the cancellations 392, while requirements were made in 1,097 cases, and there were otherwise disposed of 693; 189 were not reached; 123 entries were patented.

Carey Act.

Withdrawals, segregations, and applications for patents covering 915,676.22 acres were considered under the act of August 18, 1894 (28 Stat. 422). Either interlocutory or final action was taken thereon. The area now remaining segregated and unpatented under the act is 238,923.23 acres. There are now withdrawn under the act of March 15, 1910 (36 Stat. 237), 34,930.15 acres, and applications for 635,896.42 acres are pending.

Pittman Act.

Additional to the 13 applications not disposed of last year were 217 received. Of these 62 were approved, 55 canceled, 46 referred to the Geological Survey as petitions for designations, and 55 otherwise disposed of, leaving 12 awaiting action.

Swamp and overflowed lands.

New claims for 175,375.25 acres were added to the 105,813.66 acres of swamp-land claims on hand at the beginning of the fiscal year. Patents were issued to the States entitled thereto for 4,807.28 acres,

and selections involving 146,865.64 acres were rejected. Lists affecting 129,515.72 acres were not reached.

Arkansas and Minnesota drainage.

One hundred and sixty-six cases in Minnesota and 19 cases in Arkansas were considered under the acts of May 20, 1908 (35 Stat. 169), and January 17, 1920 (41 Stat. 392).

Withdrawals and restorations.

Executive or departmental orders withdrew 6,049,905.80 acres of public lands and placed them in a state of reservation. The purposes of the several withdrawals were set forth in the various orders. Lands previously withdrawn were restored to the public domain to the extent of 3,619,457.07 acres. In some instances privately owned lands were scattered among the public tracts. More important withdrawals and restorations follow.

National forests.

There were added to national forests 1,434,670 acres and 407,996 acres were excluded therefrom.

National monuments and parks.

All additions to national monuments and parks amounted to 302,205 acres, of which 280,970 acres are public.

Los Angeles, Calif., water supply.

Among the withdrawals in connection with rights of way matters was that made by Executive order of approximately 2,748,000 acres in California and 708,870 in Nevada pending definite location of transmission line to convey power from Hoover Dam to the city of Los Angeles.

Reclamation withdrawals and restorations.

One million two hundred and fifty thousand six hundred and forty acres were withdrawn for reclamation purposes under the act of June 17, 1902, and 3,399,400 acres previously withdrawn were restored.

State grants and State selections.

Selections of school indemnity lands including new selections and those in connection with which requirements had been made approximating 725,010 acres were received. Such selections were in addition to those involving 57,670 acres in the office July 1, 1931. Titles affecting 78,617 acres were conveyed to the States by approvals, lists embracing 11,782 acres were canceled, requirements were made as to selections involving 534,746 acres. Other disposition was made of 12,267 acres, leaving selections covering 145,268 acres awaiting consideration.

Quantity selections under grants for specific purposes.

New selections together with those previously received embrace 319,514 acres. Of these lists for 132,613 acres were approved and

title conveyed to the States. Selections for 3,212 acres were canceled, requirements were made affecting 122,862 acres and lists for 1,131 acres were otherwise disposed of. Selections for 59,696 acres were not reached. All minerals were reserved to United States in conveyances made to the State of Nevada for 13,423 acres. Specific minerals were reserved in 6,735 acres. Under cooperative agreements 833,723 acres have passed to certain States. Of this amount 14,324 acres were conveyed during the past year.

Effect of new legislation on State grants.

The act approved May 2, 1932, amending the act of January 25, 1927, and the act of May 7, 1932, amending the enabling act admitting certain States into the Union, together with the act of March 31, 1932, making an additional grant to the State of New Mexico for normal school purposes will result in largely increasing the work of adjudication in connection with State grants.

School sections.

The grant made by the act of January 25, 1927 (44 Stat. 1026), of mineral school sections has necessitated a determination by the Land Office whether the title to the State passed under the original cession grants or by such special act. Adjudications were made involving 176,677.23 acres. Title was found to have inured to the States under the original grants in cases involving 150,211.06 acres, and it was held that 24,243.26 acres passed to the various States under the special act.

Railroad grants and selections.

Railroad and wagon road listings and selections were received to the extent of 288,714.02 acres; 62,344.78 acres were certified or patented in satisfaction of the grants. Selections of 1,746.43 acres were rejected. The total area adjudicated was 287,150.19 acres.

Northern Pacific Railway Co.

The grants to the Northern Pacific Railway Co. made by the act of July 2, 1864 (13 Stat. 365), and joint resolution of May 31, 1870 (16 Stat. 378), were altered and amended by the act approved June 25, 1929 (46 Stat. 41). Certain claimed rights were declared forfeited and the institution of a suit for the purpose of carrying the amendatory act into effect was directed. The Attorney General has instituted in the District Court of the United States for the Eastern District of Washington, the suit authorized by said act, Equity No. 4389, and preliminary hearing on the points of law involved was held during the month of May at Spokane, Wash., before a special master appointed by the Federal court. No decision has been announced.

Railroad adjustment.

The work of adjusting the grants to the St. Paul & Pacific, the St. Joseph & Denver City, Atlantic & Pacific western division, Atlantic & Pacific eastern division, was completed. Two of said adjustments, the St. Joseph & Denver City, and the Atlantic & Pacific eastern division, were approved and the grants closed. The adjustment was also closed of the grant to the Amboy, Lansing & Traverse Bay Railroad Co. In connection with the adjustment of the land grant to the Leavenworth, Pawnee & Western Railroad Co., to which the Union Pacific Railroad Co. succeeded, 19,910 acres of land in Colorado within the limits of the grant were restored to the public domain. Claims were alleged to all this land by various parties, particularly under claim of color of title by virtue of purchase from the railroad company. The act of May 14, 1932 (Public No. 135), provides a method by which claimants may file applications for United States patents.

Revested Oregon & California Railroad and Coos Bay Wagon Road grant lands.

Title to lands formerly granted to the Oregon & California Railroad Co. was revested in the United States pursuant to the provisions of the act of June 9, 1916 (39 Stat. 218). The revestment act provided that such lands should be separated into three groups or classes, to wit: Power sites, timber, agricultural lands. The classification as made under the said act and the status of the land, June 30, 1932, were as follows: Power site lands, 56,682.49 acres; cruises developed that such power site lands contain a stand of 825,421,000 feet b. m. of timber. The Federal Power Commission has jurisdiction over these projects and withdrawals, but the timber on the lands is subject to sale under the direction of the Secretary of the Interior by the act of June 4, 1920 (41 Stat. 758), in the same manner as timber on lands classified as timber under the provisions of the said act of June 9, 1916. Timber lands: There were classified as timber lands 1,231,125.87 acres, containing a stand of 33,469,812,000 feet b. m. of timber of which 97,588.63 acres, containing 2,944,334,000 feet b. m. of timber, have been sold and patented to private individuals and corporations, in the manner provided by the revestment act, leaving 1,133,537.24 acres, with a stand of 30,525,478,000 feet b. m., of timber remaining unsold. Agricultural lands: 1,073,523.91 acres have been classified as agricultural in character, of which 211,114.65 acres have been patented; 83,493.92 acres are embraced in pending entries; 761,284.05 acres are vacant and subject to entry. The foregoing does not embrace areas within the indemnity limits of the grant to the Oregon & California Railroad Co., which at the date of the revestment act, June 9, 1916, were unsurveyed and included in national forests. The status of such lands is set forth in item 13-K

in the decree of September 15, 1925, of the District Court of the United States for the District of Oregon in the case of *United States v. Oregon & California Railroad Co.* (8th Fed. Rept. 2d series, 645). It was disclosed upon survey that the total acreage of such lands is 528,004.18. No information as to such areas can be given as the General Land Office has not classified or cruised the lands. Restorations were made during the year 1932 of 4,244.19 acres, classified as agricultural lands. Pursuant to the provisions of the act of June 9, 1916 (39 Stat. 218), and May 17, 1928 (45 Stat. 597), 26 sales of timber involving an area of 1,789.66 acres, containing 58,645,000 feet of timber were made for which the sum of \$92,460.75 was received. In all 821 sales covering 107,576.88 acres containing 2,418,622,980 feet of timber have been made for which a total of \$6,001,610.39 has been received.

Reacquired Coos Bay Wagon Road grant lands, act of February 26, 1919 (40 Stat. 1179).

The terms of the act of February 26, 1919 (40 Stat. 1179), under which the lands formerly granted to the Coos Bay Wagon Road Co. were reacquired provided that the lands should be classified and disposed of in the manner provided for the disposition of the revested Oregon & California Railroad grant lands by the act of June 9, 1916 (39 Stat. 218). Coos Bay Wagon Road lands have been given the following classification: First, power site, 4,543.67 acres. These lands contain 181,460,000 feet b. m., of timber. The timber is subject to sale under the act of June 4, 1920 (41 Stat. 758). Second, timber lands, 55,963.77 acres, containing 2,171,857,000 feet of timber. Of this 15,068.83 acres containing 615,854,000 feet of timber have been sold to private individuals and corporations in a manner provided by law, leaving 40,894.94 acres with a stand of 1,556,003,000 feet of timber unsold. Third, agricultural lands, 34,147.95 acres have been classified as agricultural. Of this area 8,841.15 acres have been patented, 7,871.25 acres are embraced in pending entries, 17,435.55 acres are vacant. During the fiscal year 1932, 2,929.80 acres of reacquired Coos Bay Wagon Road lands within the Roseburg district were restored to homestead entry.

Coos Bay Wagon Road grant timber sales.

Two sales were made involving 160 acres of land containing 7,105,000 feet for which the sum of \$17,332.50 was realized. There have been to date 98 sales covering 17,380.78 acres containing 693,177,000 feet of timber, for which \$1,609,947.34 was received. Extension of time in which to cut timber under the provisions of the act of May 19, 1930 (46 Stat. 369), authorizing the Secretary of the Interior to extend the time for cutting and removing timber from revested and reconveyed lands in Oregon under the acts of June 9, 1916, and February 26, 1919, were granted involving 1,913.79 acres.

Oregon-California tax unit, act July 13, 1926 (44 Stat. 915).

Approximately 2,300,000 acres of land the title to which reverted in the Government under the act of June 9, 1916, is made subject to payments for amounts in lieu of taxes under the provisions of the act of July 13, 1926 (44 Stat. 915). The valuations used are those employed by the Secretary of the Interior in the payment of the accrued taxes for the year 1915 and the rates are fixed by the annual lawful levies on privately owned properties. The General Land Office checks, audits, and certifies for payment, if found correct, the accounts of the several counties under the foregoing act. Claims receiving consideration during the fiscal year 1932 were as follows: 14 for the year 1930 were examined and certified for \$383,189.64, and 9 claims for the year 1931 for \$308,016.42. Total payments approved and certified during the year \$691,206.06, net disallowances from the above claims amounted to \$2,369.31. Three claims for the year 1931 for \$73,203.08 were pending at the end of the fiscal year.

Alaska.

Forty cases involving sale of lands in Alaska for trade, manufacturing or other productive industry under section 10 of the act of May 14, 1898 (30 Stat. 413), were examined and 5 patents issued.

Permission was granted to the Alaska Road Commission to conduct the sale of certain buildings located on the former Fort Egbert Military Reservation. The buildings were appraised at \$645 and the sale was held on June 15, 1932. Regulations were issued governing the sale of lands within the abandoned Point Campbell Military Reservation at Point Campbell near Anchorage, Alaska. The Government lands in 5 abandoned military reservations and 21 signal corps stations in Alaska were restored to the public domain.

Town sites, parks and cemeteries.

Reservations for the town sites of Macon and Wheaton and withdrawal orders for town-site uses in four other localities in Montana were revoked. Extensions of time within which to make deferred payments were granted to purchasers of lots in Harding, Fla. Patent for the west side addition to Superior, Ariz., was issued on the application of the judge of the superior court. Sale of town lots was conducted at Salina, N. Mex., and a survey was ordered for lots in Wadsworth, Nev. Two Indian villages at Hoonah and Wrangell, Alaska, were surveyed. Thirteen town-site matters were adjudicated, 813 town lots considered, and 253 patents were issued. Patents for parks and cemeteries were granted to the towns of Hatch, N. Mex., Wickenburg, Ariz., Fruita, Colo., and Skagway, Alaska, under the act of September 30, 1890 (26 Stat. 5010).

New laws.

Thirty-seven reports were submitted on enrolled bills. Fifty-five new public or private acts affecting the activities of the General Land

Office became laws through the approval of the President. Instructions or regulations affecting 51 of such acts were promulgated. Memoranda on proposed reports on 273 bills pending before the committees of Congress were submitted for the consideration of the department.

Tract book notations, preliminary examinations, cancellations, and relinquishments.

Public-land withdrawals made by 1,174 letters or Executive orders were noted on the records. These include withdrawals for stock drive-ways, national forests, power-site reserves and classifications, restored lists, designations under the various homestead acts, etc. Cancellations on 2,780 relinquishments and 1,255 entries for failure to make proof within the statutory period were noted. Status for the benefit of adjudicating clerks was furnished in 28,882 cases. The total number of tract book notations made was 160,680, which includes 72,104 appeals and other miscellaneous cases, 2,396 Indian allotments, 4,965 final and cash certificates, 2,411 oil and gas applications, 302 coal applications, 12,275 original entries, and 589 plats posted.

Exchanges.

Various acts permit the exchange of Government land or timber for private holdings. Some of these are based on equality of area, others equality of value. The purpose of such exchanges is to eliminate private ownership in areas intermingled with lands owned by the Government and which are being administered for the public benefit. Consideration of 99 cases under the act of June 4, 1897 (30 Stat. 36), resulted in the issuance of 12 patents. Exchanges under the forest consolidation act of March 20, 1922 (42 Stat. 465), were before the office in 604 cases and 37 patents were issued; as result of these forest consolidation exchanges 187,179.05 acres were added to the national forest. The elimination of private-land owners from the Petrified Forest National Monument in Arizona by taking over such lands in the place of other tracts owned by the Government without the limits of a forest was provided by the act of May 14, 1930. One exchange under this act was perfected resulting in the elimination of private ownership in the said monument to 12,792.80 acres. Approximately 5,500 acres in this monument remain in private ownership, and this acreage is embraced in two applications to exchange filed but not disposed of during the year.

Trespass.

Trespass on the public domain involving timber, coal, gravel, and turpentine was considered in 1,496 cases. The Government received and accepted as damages \$82,999.47.

Unlawful inclosures.

The erection or maintenance of unlawful inclosures on public lands by persons having no claim or color of title thereto is forbidden and prohibited by the act of February 5, 1885 (23 Stat. 321). Action was taken on 84 cases and many unlawful inclosures were abated.

Abandoned military reservations.

Determination by the President that abandoned military reservations are useless and certification by him of such areas to the Secretary of the Interior for survey, appraisal and sale was authorized by the act of July 3, 1884 (23 Stat. 104). The act of August 23, 1894 (28 Stat. 491), and amendatory acts provide for the opening to homestead entry of abandoned military reservations where the area exceeded 5,000 acres. Disposition was made of 125 cases under such acts. The sum of \$7,114.06 was realized from sales of abandoned military reservation properties. Patents issued for 11 homesteads and 6 sales.

Color of title.

The patenting of public lands which had been held under color of title for more than 20 years where valuable improvements and cultivation have been made, was provided by the act of December 22, 1928 (45 Stat. 1069). All minerals are reserved to the Government in lands patented under such act and payments required at a price to be fixed by the Secretary of the Interior. Disposition was made of 348 cases of this type. One thousand eight hundred forty-seven dollars and fifty-five cents was realized from 17 patents involving 511.72 acres; 17 applications were presented and 8 patents were issued under color of title claims situated in the State of Michigan under the act of February 16, 1929 (45 Stat. 1188). Fifty-one color of title claims for tracts in New Mexico were considered and 31 patents issued under the act of June 8, 1926 (44 Stat. 709).

Erroneously meandered areas.

Claims under the acts of February 27, 1925 (43 Stat. 1013), and February 19, 1925 (43 Stat. 951), providing for the sale of erroneously meandered lands in Wisconsin and Louisiana, respectively, were considered in 158 cases, all of which except 1 were for lands in the State of Wisconsin. Six patents were issued for lands in Wisconsin and 1 for tracts in Louisiana.

Repayments.

Repayments may be made to the applicant, his heirs or assigns where lands have been erroneously sold, where payments have been made in excess of lawful requirements, and where applications, entries and proofs have been rejected in the absence of fraud or attempted fraud. Under these laws 147 accounts were stated allowing repayment of \$9,613.99 and 204 claims for repayment were denied. Among claims allowed were 12 permitting repayment of \$1,177.97 received

in connection with the sale of Indian reservation lands, and repaid from Indian trust funds.

Private land grants.

Persons whose ancestors were among the early settlers receiving grants from former governments make many inquiries concerning foreign grants with the belief or hope that some right or title is outstanding to which they may succeed or for which they might receive compensation. In California the presentation of homestead applications for lands in patented private claims has continued notwithstanding the efforts of the department to inform the applicants of the futility of their actions. The promoters of the scheme ignoring the decisions of the Federal courts assert that the Mexican grants were invalid.

Equitable adjudications.

Decided on principles of equity, referred to the Board of Equitable Adjudication, and confirmed were 921 cases.

Timber sales.

The laws granting the sale of dead, down, or damaged timber on public lands outside of national forests were invoked in 49 instances and the sum of \$957.90 was realized from sales; 17 applications were considered and 9 permits issued under the act of June 3, 1878 (20 Stat. 88), and the act of March 3, 1891 (26 Stat. 1023), as amended, providing for the free use of timber.

Military bounty land warrants, soldiers' additional homesteads, and small holding claims.

The records of military bounty land warrants contain information of an historical nature and there has been much correspondence concerning the warrantees or their descendants. Disposition was made of 19 cases involving warrants and 2 patents issued on old warrant locations; 577 soldiers' additional homestead applications were before the office and 46 patents were granted; 27 small holding claims were adjudicated, resulting in 14 patents.

Cash and credit system entries, scrip, quitclaim deeds.

Unperfected cash and credit system entries under laws which governed the disposition of the public domain in the early existence of the Government were considered in 16 cases and 9 patents were issued. Comparatively few cases, only 93, of the various kinds of scrip evidenced by certificates were presented and of these only 3 were passed to patent. Section 6 of the act of April 28, 1930 (46 Stat. 256), authorized the Commissioner of the General Land Office to issue quitclaim deeds where title to lands has been inadvertently relinquished to the United States. Four quitclaim deeds were so executed.

Accretions, Louisiana and Mississippi, and lieu selections for canceled confirmed entries.

Provision was made for disposition of the accretions to lands on Glasscock Island in the Mississippi River by the act of April 11, 1928

(45 Stat. 422). Two claims were finally decided under this act. Litigation in the courts over the land involved was terminated. Conflicting claims were rejected, and two patents were issued. Twelve cases were decided and three patents issued pursuant to the provisions of the act of January 27, 1922 (45 Stat. 359), authorizing selections in lieu of confirmed entries erroneously canceled.

Stock-raising homestead entries.

During the fiscal year 1932, 7,291 original stock-raising homestead entries for 3,543,582 acres were allowed and patents were issued on 2,460 final stock-raising homestead entries embracing an area of 1,099,642.70 acres. In all 62,531 final stock-raising homestead entries embracing 23,440,896.60 acres have passed to patent.

Reserved deposits.

Patents to the extent of 1,223,712.21 acres issued with a reservation of all or some specific minerals and were distributed in the following manner: Stock-raising homesteads, all mineral reserved, 1,099,642.70 acres; miscellaneous, all minerals reserved under other than the stock-raising homestead acts, 20,689.08; coal reserved, 35,944.05 acres; oil, gas, phosphate or other named minerals reserved, 67,436.38. The mineral deposits reserved to the United States in 1932 added to those of previous years total 35,902,557.22 acres.

Increasing activities of the General Land Office.

The act approved April 23, 1932 (Public No. 104, 72d Cong.), authorizes the Secretary of the Interior in his discretion to open to location, entry and patent under the mining laws with reservation of ways, rights and easements, public lands of the United States which are known or believed to contain valuable deposits of minerals and which are withdrawn from development and acquisition because they are included within the limits of withdrawals made pursuant to section 3 of the reclamation act. Regulations under the act have been issued and are set forth in circular No. 1275 dated June 22, 1932. It is expected that this will greatly increase the number of locations made under the general mining laws. There has been an increase in the number of applications for coal, potash, sodium, and phosphate leases and permits during the current year. While the number of new applications for coal permits, leases, and licenses do not show a great increase over last year, the various questions of relief arising under certain sections of the outstanding coal leases cause more careful adjudication of each case than is usually required in considering new applications. New questions concerning the consolidation, modification, and cancellation of outstanding coal leases require more time and consideration on the part of the adjudicator so that the Government's interests will not be impaired. On many coal permits about to expire there arise for consideration petitions for extension of time. In the past

year there has been quite an increase in potash lease and permit applications due to large companies and corporations throughout the country promoting the development of the potash industry in the United States. Applications for sodium permits and leases and phosphate leases, while not as numerous as the coal and potash, do not indicate that they are by any means on the decline.

The act approved May 2, 1932, amending the act of January 25, 1927, which grants certain mineral school sections to States and provides for the relinquishment of indemnity school land selections and the act approved May 7, 1932, amending the act admitting into the Union the States of North and South Dakota, Montana, and Washington, and the act approved March 31, 1932, granting 76,667 acres to the State of New Mexico for normal school purposes as pointed out elsewhere will add materially to the duties heretofore imposed on the Commissioner of the General Land Office.

RECAPITULATION

Areas administered in whole or in part by the commissioner under the direction of the Secretary

	Acres
Vacant lands subject to all applicable public land laws.....	173, 318, 246. 00
National forest land subject to all mining laws and possible homestead entry.....	133, 800, 000. 00
Stock-raising homesteads, all mineral reserved.....	23, 440, 896. 60
All minerals reserved in patents under various acts other than stock-raising homestead law.....	104, 472. 14
Coal reserved.....	10, 727, 659. 32
Oil, gas, phosphate, or other named mineral reserved.....	1, 629, 529. 16
Stock-driveway withdrawals subject to the mining laws.....	9, 535, 955. 00
Existing unperfected entries, etc.....	24, 164, 842. 00
Producing oil and gas fields.....	843, 106. 00
Carey Act withdrawals.....	925, 830. 00
Power site reserves.....	5, 005, 242. 00
Public water reservations.....	437, 249. 00
Reservoir sites.....	254, 010. 00
Miscellaneous reserves.....	1, 460, 847. 00
Reclamation withdrawals.....	13, 400, 000. 00
<hr/>	
Total subject to all or some applicable public land law or in which the Government has or may have an interest.....	399, 047, 884. 22
Alaska.....	378, 165, 760. 00
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Grand total..... 777, 213, 644. 22

The totals under "Stock driveways," "Power site," and "Miscellaneous reserves" included about 10 per cent privately owned lands. The areas not in Government ownership in producing oil and gas fields are not known. Lands in Indian, military, and naval reservations or withdrawals are not included, nor are those in national parks or monuments.

THE INDIAN SERVICE

SUMMARY OF THE COMMISSIONER'S REPORT

The Annual Report of the Commissioner of Indian Affairs for the fiscal year ended June 30, 1932, stresses the effect of economic conditions during the past year. Practically every division having to do with the Indian as a person was called upon for relief of some sort. First the drought and grasshopper devastated regions of the Northwest, then the storm-stricken areas in New Mexico and Arizona were real emergencies and called for quick action. As these events were unforeseen and the Congress had not yet convened, and we had insufficient funds available, we called upon such agencies as the Red Cross and the Army which responded most generously. After Congress convened we were able to get additional relief funds totaling \$410,000 for use during the year, and were able to meet all legitimate demands for relief.

In the schools we felt that it was necessary to take in more older children, overcrowding slightly in order to relieve homes that felt distress. However, the most significant thing in education was the continuation of the policy to change the boarding-school attendance to local day or public school attendance wherever possible. At the end of the year six more boarding schools were closed and two were placed on the list to be closed at the end of this year. We make special mention of the closing of the Pima Boarding School on the Pima Reservation in Arizona and the establishment of two consolidated day schools at Casa Blanca and Santan and the use of the old boarding-school plant as a central high and vocational school to which the pupils of the seventh grade and above are transported by bus, and also feel that the change of the schools at Lac du Flambeau, Wis., and Hoopa Valley, Calif., to day schools will be of more benefit to the Indian community. Whenever possible all changes have taken place only after preparations for the change had been carefully made; a staff of qualified school social workers (visiting teachers) has been recruited for this purpose.

The report also stresses the reduction of numbers and particularly the elimination of small children from the large boarding schools. This program was begun several years ago which involved the dropping of one elementary grade each year in the larger schools. At the present time Haskell Institute at Lawrence, Kans., and Flandreau Indian School, Flandreau, S. D., have no pupils below the ninth

grade. The Albuquerque Indian School has no pupils below the seventh grade; Sherman Institute, Calif., Salem Indian School, Oreg., and Phoenix Indian School, Ariz., have no pupils below the sixth grade. With the above-mentioned changes there were at the beginning of the present school year about 2,000 fewer Indian children in the boarding schools than there were a year ago.

A substantial increase is shown in the number of contracts with school districts for tuition for Indian children in public schools and in the actual numbers enrolled, the number of contracts made for the year 1932-33 totaling 1,160, as compared with 998 for the fiscal year 1931-32, and 841 for the year before. The number of Indian children attending public school was over 48,000 as compared with 43,000 in 1931.

In higher education we are offering the following opportunities: (1) Educational loans from Federal or tribal reimbursable funds repayable in eight years, (2) room and board at Indian schools located close to universities and colleges in return for a certain amount of labor, (3) payment of tuition fees to State universities and colleges, and (4) scholarships at various institutions.

In order to continue the policy of emphasizing local education in Alaska, we closed the Kakanuk Orphanage and the children were sent back to the local communities and in a few instances transferred to one of the few other boarding schools. The new boat "The North Star" was finished in time to make her first trip before the close of the fiscal year.

The position of director of education for the natives of Alaska was set up with headquarters at Juneau to take the place of the chief of the Alaska Division which was abolished. The appointee to the new position has had training and experience in education, anthropology, and business administration.

There has been an increasing number of Indians seeking medical and hospital treatment, and continual improvement has been shown throughout the health service. Other public-health workers, including the United States Public Health Service and various State, county, local, and voluntary health agencies, have continued their participation in cooperative work. The United States Public Health Service has continued to detail personnel to the Indian Service and has made available not only the services of its medical officers, field directors, and sanitary engineers but also facilities of the National Institute of Health. Investigations of water supplies, sewage disposal, milk production, and the control of venereal diseases have been continued.

The health service has increased the facilities of the general hospitals throughout the service for the care and treatment of tuberculosis, and special attention through field nurses has been given to maternal and infancy welfare and a proper dietary for Indian children.

The statistical table showing the number of babies born in Indian Service hospitals speaks for itself; for the year 1932, there were 1,888 births as compared with only 595 five years ago. There were approximately 38,504 examinations for trachoma made by special physicians, not including examinations made by the hospital, agency, and school physicians. This compares with 30,000 the year before. The number of surgical operations performed on trachoma cases was 1,886, as compared with 1,330 in 1931. There were 2,422 nonsurgical treatments for trachoma in 1932, as compared with 2,175 in 1931. The total number of vaccinations and inoculations performed during the year for smallpox, typhoid, diphtheria, Rocky Mountain spotted fever, and other diseases was 37,022, as compared with 29,437 the year before.

One new hospital with a capacity of 30 beds was completed, and six more are under construction and are nearly completed. The Hopi-Navajo Sanatorium at Winslow, Ariz., with a capacity of 35 beds, has been contracted for, and the plans and specifications of the sanatoria at Albuquerque, N. Mex., and Pierre, S. Dak., are complete.

In Alaska the first medical director for work among the natives was appointed early in the fiscal year. Doctor Fellows, the medical director for Alaska, detailed to the Indian Service by the United States Public Health Service, has been making a general survey and appraisal of the existing health facilities and such changes in personnel and type of service to improve the health service there.

The most encouraging reports have been sent in by our extension representatives in the field. More gardens and field crops were planted during the last spring than for any time in the past ten years. From 25 reservations the extension agents report for the calendar year 1931, 12,690 gardens planted, with an acreage of 10,846, and 138,281 acres planted in field crops. The extension agents on the above 24 reservations made 36,739 personal farm and home visits; in our report last year we reported 1,962 personal farm and home visits for 10 agricultural extension agents. In the home extension work which was carried on on 10 reservations 2,975 gardens of 2,164 acres were planted, 2,665 garments renovated, 9,000 articles of clothing were made, and other projects, such as poultry raising, cheese making, pest eradications, tribal arts and crafts, food conservation and storage, better bedding, home care, etc., were promoted.

Requests for cancellation of agricultural leases, reduction of rentals, acceptance of other considerations in lieu of cash have been received from practically all the reservations where Indian lands either tribal or allotted are under lease. We have endeavored to solve the problems relative to collection of delinquent rentals, extensions or changes of existing contracts in a manner that will not jeopardize the Indian

lessor, and no changes in lease contracts have been made without his consent.

During the year a director of employment was appointed. This is an end toward which we have been working for several years. He was appointed toward the close of the fiscal year and up to the end of the fiscal year had completed an industrial survey of the Menominee Indian Mills, and a revised plan of organization based upon a survey of the needs of employment of the last three years.

Due to the economic distress in the lumber industry there is nothing very encouraging that we can report in our forestry operations in regard to timber sales. During the fiscal year 1932 we were able to advance materially the effort to consolidate ranges, reduce trespass, and introduce conservation measures of grazing management on Indian lands. During the year considerable study has been given to road improvement on Indian reservations.

A very important piece of legislation was enacted during the last session of Congress. It is the act authorizing the Secretary of the Interior to adjust or eliminate reimbursable charges of the Government of the United States existing as debts against individual Indians or tribes of Indians in such a way as shall be equitable and just in consideration of all the circumstances under which the charges were made. While this legislation primarily effects irrigation reimbursable charges, it includes all classes of reimbursable charges owing to the United States by individuals or tribes of Indians. It definitely defers the collection of all construction costs against any Indian-owned lands within any Government irrigation project and prevents the assessment of construction costs or charges against Indian lands until the Indian title has been extinguished, and cancels construction assessments previously levied against Indian lands that remained uncollected.

The chaotic condition in the oil business caused lessees to surrender an unusual number of nonproducing oil and gas leases of restricted Indian lands for cancellation. New leases were made covering about 25,300 acres consisting of allotted lands with the exception of about 8,000 acres of tribal lands on the Osage Reservation.

The work of the Pueblo Lands Board has in the main been completed. Only a skeleton board remains. The services of a special attorney have been obtained to make a final investigation and determination of what remains to be done to carry out the findings of the board. The total sum appropriated by Congress for the Pueblo Indians in compensation for losses sustained now amounts to \$620,904.58. The total sum awarded by the board to the non-Indian claimants now amounts to \$217,250.22 which was proposed to be appropriated by bills introduced in the last Congress but which were not enacted.

THE OFFICE OF EDUCATION

SUMMARY OF THE COMMISSIONER'S REPORT

In the organic act of March 2, 1867, by which the Federal office for the study of educational problems was first set up, the activities of the present Office of Education are defined: (1) Collecting such statistics and facts as shall show the condition and progress of education in the several States and Territories, (2) diffusing such information as shall aid in the establishment and maintenance of efficient school systems, and (3) otherwise promoting the cause of education throughout the country.

RESEARCH AND INVESTIGATION

Public education has encountered a trial by fire during the past year. The soundness of its program and the adequacy of its present form of organization and support are facing severe tests, in which both the public and the educational profession join. Requests for information and for service, as shown by incoming mail to the office, have increased more than 10 per cent during the past year. In order to furnish the desired information, to supply basic data concerning education conditions throughout the country, to describe new and promising movements in education, to analyze important education problems, a wide variety of investigations have been undertaken during the past year, resulting in 114 publications, besides many shorter reports in periodicals and news releases.

School administration.

In the field of public-school administration four studies were completed. In order to furnish information regarding the various types of units of administration, a bulletin has been prepared showing the principal features of each type of administrative unit, but emphasizing especially the county unit.

An important problem facing local school superintendents is the basis of another study which describes the methods used by school superintendents and boards of education in the selection and appointment of teachers. Another study contains data showing the status of the elementary school principalship in terms of education, experience, salaries, etc., which will afford superintendents data for comparative purposes.

A study of the status of teachers and principals employed in the rural schools of the United States was undertaken because of the

peculiar dependence of the educational welfare of rural children upon the character and fitness of those in charge of their schools and because no other organization gathers and publishes information on this important group of public servants. Improvement and progress in the education of rural children comes slowly unless we have sufficient facts upon which educators may build and which enable the public to understand the true situation.

Legislation.

One of the important responsibilities of the office is to maintain an up-to-date record of legislation affecting education in the various States. Three compilations have been made this past year: (1) The study of the legal and regulatory provisions affecting secondary education; (2) principal provisions of the State laws on the subject of free textbooks for public-school children; (3) State legislation relating to kindergartens.

Curriculum.

Since courses of study in the schools of the country are being continuously revised, the Office of Education is attempting to prepare a series of guidebooks that may be helpful to superintendents and curriculum committees. Two have been completed, one in safety education, and one in science for the elementary school.

Statistics.

The statistical studies carried on by this office are of three general kinds: (1) Biennial reports of personnel and finances of city schools, of each State, of private schools, of colleges and universities; (2) periodic or recurring studies of certain educational problems made less frequently than every two years; (3) special, or occasional studies of some current situation. More than 60,000 inquiry forms were tabulated in preparing 25 statistical reports. This year the statistical program has been revised on a 10-year basis to distribute the load more evenly. Heretofore an almost impossible tabulation load has fallen on the year following the closing of a biennium. As an early step in carrying out the new statistical program, the inquiry forms have been thoroughly revised and an entirely new set of forms has been developed for institutions of higher education, following as closely as possible the report of the National Committee on Standard Reports for Institutions of Higher Education.

Nursery schools.

Among the newer movements in education is the organization of nursery schools. In 1920 there were about 3 such schools in the United States, now there are more than 300. A bulletin has been prepared describing current practices in the organization and operation of nursery schools in public-school systems and in connection with colleges, private schools, philanthropically supported

institutions, and welfare agencies. There has also been prepared a bibliography on nursery education and directory of nursery schools in the United States in 1931.

Secondary education.

Information gathered through a study of the characteristics of secondary education in rural centers shows that 45 per cent of the high schools of the United States enroll 50 pupils or fewer, and more than 80 per cent have an enrollment not exceeding 100 pupils. The study shows the outstanding characteristics of these numerous small high schools and discloses successful practices for their future guidance in reorganization.

School hygiene.

The most important study of the year in school hygiene is that of the relation of physique and physical condition to intelligence and scholarship. During the past 40 years nearly 200 students have applied the statistical method to various phases of this subject, and it has been the purpose of the present investigation to piece all of these separate patches of science together so that they can be viewed as a whole and the general relationship of mind and body more clearly defined. In another hygiene study a classification of 9,000 pupils, posture-wise, was made in the elementary schools and of the freshmen of the Miner Normal School. The statistics thus obtained confirm the conclusions reached from previous studies by this office that the carriage of the body is as much an hereditary trait as our facial features, and that it can not be essentially modified by any ordinary means.

Guidance.

Guidance and industrial education occupy a prominent place in educational thought at the present time. On request of the national committee on State guidance programs of the National Vocational Guidance Association, the Office of Education entered upon a cooperative study, with that committee, of the guidance activities of State departments of education. It includes suggestions as to methods of organizing State guidance services.

Tests and measurements.

In recognition of the growing demand for research and service in the field of educational tests and measurements the office has this year added to its staff a specialist in this field. Several studies have been completed and others are under way. An intensive study of the techniques of the diagnosis of an individual's strengths and weaknesses through the use of tests will be of service in guidance of pupils; a survey of the best practices in testing work in city school systems

should be of value to city research bureaus; the use of tests in prognosis will also furnish techniques for educational guidance.

Higher education.

While the movement originated earlier, the economic depression has hastened the urge to coordinate or consolidate the public institutions of higher education within a given State so as to avoid duplication and competition. To be in position to respond to the States calling upon the Office of Education for assistance, a series of three studies was planned and carried halfway to completion: First, the assembling of data which reveal variations among the States in their financing of higher education and in the percentages of their young people who attend college; second, a study of the governing authority and curriculum offerings in institutions of higher education State by State; third, an investigation of the development of higher education in a few typical States where the movement for consolidation has made the greatest headway. It is believed that such a study will shed light upon the problems which the various States confront in coordination or consolidation of higher education.

Special education.

In the field of special education there is a wide demand for practical service to teachers and parents of children who, because they are different, need special educational consideration. During the year we have planned publications to emphasize this type of service. The first of this particular series is a bulletin on parents' problems with exceptional children designed primarily for the use of parents and parents' study groups. A similar bulletin on teaching problems with exceptional children, somewhat more extensive in scope and designed to give practical help to teachers with their most pressing problems, is in preparation. Another bulletin of assistance to teachers seeking further preparation in this special field, *Opportunities for the Preparation of Teachers of Exceptional Children*, has just come from the press.

Negro education.

Service to the education of the Negro population, which includes nearly 4,000,000 educables, has been carried on this year through three major research projects: (1) A survey of secondary education for Negroes designed to gather and interpret information not hitherto available, which will show the availability, status, and trends in secondary education for Negroes throughout the United States; (2) a study of elementary rural education among Negro schools working under the direction of the Jeanes supervising teachers, which will help to reveal successful practices as well as imperative needs among Negro elementary schools; (3) a survey of 2,000 Negro college students through a personnel study of their social, cultural, scholastic, and

intellectual background factors, which will furnish significant information concerning different types of elementary and high schools.

Education of special groups.

During the year a personal investigation of education facilities provided for the natives of Alaska made during the last month of the preceding year was followed at the beginning of this year by a similar study concerned with the education of indigenous peoples in Mexico. Through the courtesy of the Federal education officials of that country a member of the staff visited schools in 9 of the 28 States, observing at first hand the extensive nation-wide experiment under way in applying the principles underlying progressive education as practiced in the United States to the Mexican situation. As a result of the visit a bulletin describing the experiment, a 3-reel moving picture, and a set of slides showing schools in action were prepared for the information of educators in the United States.

To secure information about the educational provisions available and needed, a social and economic survey of the southern Appalachian Mountains is now nearing completion. It was made in cooperation with the United States Department of Agriculture and officials of six Southern States. It involves 205 counties lying along the ridge of the southern Appalachians and will gather all available facts concerning the educational welfare of children living in the southern mountain districts. When completed the study should offer a basis for more intelligent understanding of educational conditions in the backward communities involved.

In many communities the education of foreign-speaking children introduces difficult and specialized problems. A study has been made this year of the education of Spanish-speaking children in certain Southwestern States. This study should throw light on the problem of bilingual education elsewhere.

School buildings.

The purpose of the office in its work on school buildings is to assist States and cities in solving their school-building problems by (1) making school building surveys at the request of State and city educational authorities; (2) conducting research on fundamental school-building problems which are common to all communities. A study just completed, *The Functional Planning of Elementary School Buildings*, has been carried on in close cooperation with the leading experts on school-building problems from all parts of the country.

STIMULATION AND COORDINATION OF RESEARCH

The Office of Education attempts to stimulate research along worthwhile lines and to assist in coordinating the work of these many research

agencies interested in similar problems. One means of accomplishing this purpose is the provision of materials for research in education.

Materials for research in education.

During the past year four bibliographies of educational research have been issued, in which reports from State, city, and university research bureaus as well as from many other agencies and individuals are included.

Some of the most extensive and valuable research in educational problems is carried on in the graduate schools of our universities. This past year with the indorsement of deans of schools of education the office invited graduate schools, schools of education, and graduate students in education to join with the office in making a collection of graduate theses in education available for reference both in the library of the Office of Education and through interlibrary loan. In reply to the invitation about 400 theses were received for deposit in the library before July 1.

Each national survey collects and reports a vast amount of material, but in the original records for each report are the necessary data for many other tabulations and studies of specific problems. The past year data from the surveys have been furnished to State teachers' associations, State departments of education, universities and colleges, national professional organizations, and graduate students.

Conferences.

One of the most significant services which the Office of Education can render higher education is to stimulate as far as possible both the extent of this research in the field of higher education and the demand for a careful scientific procedure in it. One way of so doing is to cooperate with universities in calling regional conferences of those who are most actively engaged in research in the field of higher education. The first regional conference was held in cooperation with the University of Oregon in April, 1931. Similar conferences were held during the spring of 1932 at the University of Pittsburgh and at the University of Kentucky. Several others are planned for the fall of 1932. The report of the Oregon conference incorporating important papers has been published as a bulletin.

State histories.

Following a report that only 8 of the 62 extant State histories of education are reliable and up to date and that 9 States have no published account whatever of the development of their school systems, the office is cooperating with a committee on State histories of the National Society of College Teachers of Education and with the National Committee on Research in Secondary Education in stimulating the preparation of readable, authoritative records of

educational developments in the several States and of educational movements of national significance. Two manuscripts have been approved by the committee on State histories and accepted for publication by this office. They are *The History of the Municipal University in the United States* and *The American Lyceum*. The committees report that progress has been made this past year on 15 State histories.

Homemaking education.

With the hope of being of service to schools interested in improving their home economics programs the office has continued its series of conferences, holding one on May 2-3, 1932, at Amherst, Mass., and another on May 16 in Minneapolis, Minn. The first one, held in cooperation with the six New England State commissioners of education and the Massachusetts State College, featured the place of homemaking in a program of education. The second conference aimed to present a comprehensive picture of homemaking education as it obtains in our public schools, colleges, and adult education agencies, and was held in conjunction with the National Congress of Parents and Teachers with 10 national, State, and local organizations assisting. In addition to the conferences, the office has tried to stimulate needed research in the field. Last year's report described some of the studies carried on cooperatively by this office and committees appointed by the commissioner following the homemaking conferences. This year has seen the completion of four of the studies.

EDUCATIONAL SERVICE

In a sense the entire program of the Office of Education is a service program. The problems for investigation are selected with an eye to their practical use to schools generally. In a similar way the other activities of staff members are designed to be of service to schools and the cause of education throughout the country.

Surveys.

The office regularly receives many more requests for assistance in making school surveys than its limited staff permits it to grant. During the early spring of 1931, the Board of Education and the Chamber of Commerce of Youngstown, Ohio, invited the Office of Education to make a survey of the public schools of that city. A joint committee presented a series of questions upon which the survey should focus. The field work was done during the months of September, October, and November, 1931, by members of the staff and invited specialists. The report on the survey was completed in December and presented to the Youngstown Chamber of Commerce, by whom it was printed.

The office has cooperated with States engaged in the various steps of consolidation. Members of the staff served as counsel for the commission on consolidation of the State institutions of higher education in North Carolina, and for the commission on consolidation of higher educational institutions in South Carolina, assisted in the survey of higher education in the State of Mississippi, and was represented on the advisory committee of the State commission of Virginia for the establishment of a State college for women as a part of the University of Virginia.

Library service.

In a very real sense the office is built around the library, dependent upon its collection of more than 150,000 volumes and the efficiency of its organization in maintaining prompt and valuable information service and carrying on its investigations. Approximately 12,000 publications were accessioned this year. The book collections of courses of study, college catalogs, and foreign education documents, have had especial attention.

One important function of the library is service to elementary and secondary school and college libraries, including advisory service on progressive practices and equipment, as well as investigations of library problems, and their interpretation in practical form. Under a grant-in-aid from the Carnegie Corporation a study was made this year of rural school library services and practices. All together 318 rural schools and 50 county libraries in 36 States were visited and personal interviews were held with staff members of State educational and library agencies. School library activities in State teachers' associations was the subject of another and briefer study.

Foreign school systems.

The service activities of the office in the field of foreign school systems are chiefly in three categories: (1) Gathering, interpreting, classifying, and keeping in order data about education in foreign countries; (2) using that material to aid any persons to whom such information may be valuable; and (3) helping to interpret to foreigners education in the United States.

The foreign education library collection is probably the best in this country. The sources of information are requested: Voluntary reports from the diplomatic and consular offices of the State Department; official publications of all kinds such as laws, decrees, arrêtes, and bulletins issued by school authorities abroad; and nonofficial periodicals, books, brochures, etc., on education in other countries.

During the year the office handled 819 requests for credential evaluation with documents from 70 different political divisions. This was an increase of 229 cases over the previous year. In September, 1931, the office began work with a committee of the American

Association of Collegiate Registrars in securing and publishing material concerning higher institutions abroad by which registrars in the United States can evaluate students' credentials. A manuscript on institutions of higher education in Sweden has been written, sent to the committee for its approval, and, having been approved, is now in the Government Printing Office. A second study, Institutions of Higher Education in Norway, is in preparation, and Office of Education Circular No. 38, Information About the Certificates Issued by the Scottish education department, was mailed to about 250 colleges.

Conferences.

The office is committed to a program of research as its chief means of promoting the cause of education. Since investigation of problems, local and general, as well as desirable activities of other sorts, may often be stimulated through conferences, several have been held during the past year at the request of and in active cooperation with various local sponsoring organizations. During the year the office held two conferences in homemaking education, one in higher education, one in problems of supervision. At the invitation of the American Peace Society, the Office of Education arranged the program, conducted the meetings, and made the report of the Commission on Education of the American Conference on Institutions for the Establishment of International Justice, held at Washington, May 2 to 5, 1932.

Education of adults.

The education of adults both through schools and through informal agencies has assumed new importance because of the large number of unemployed adults who sought more training or re-training for specific economic use. With the cooperation of the President's Organization for Unemployment Relief, the Office of Education collected information as to what educational opportunities for the unemployed are offered by public-school systems in this country. Reports were received from a large number of cities, and a summary of these reports was published in mimeographed form by the President's organization.

Parent education.

Every year hundreds of parents apply to the Office of Education for assistance of one kind or another. In addition to individual parents who have demanded service, educational institutions, leaders of parents' groups, study and reading groups, and leaders in national, State, and local parent-teacher associations, have called upon this office for various kinds of help. Circular No. 54, 1932, contains a list of publications of the Government useful for study or discussion groups, or for program material for parent-teacher associations. More than 45 colleges, universities, or State teachers colleges included

in their 1932 summer sessions either courses or conferences, or both, in this field; Circular No. 45, 1932, contains descriptions of typical opportunities offered in 1931 summer sessions. Another circular distributed widely this year shows where parents and leaders in parent education may find authoritative material on the organization and methods of parents' study groups and courses for reading or study on parents' problems.

Education by radio.

The Office of Education is called upon to answer a constant stream of inquiries on the subject of education by radio. In response to requests of various educational and broadcasting groups, the office has assisted in setting up and evaluating broadcast programs of educational material, and has also initiated certain research needed to make better use of radio as an educational agency. Three studies have been undertaken: Suitable Radio-Sound Equipment for Schools; How to Broadcast for Schools; Education in the German Broadcasting System. In addition, the office is cooperating with the National Advisory Council on Radio in Education in making a survey of national voluntary organizations' use of radio; and with the National Committee on Education by Radio and the United States Department of Agriculture in making a survey of radio activities in land-grant colleges and independent State universities.

INFORMATION SERVICE

Incoming mail during the past year totaled approximately 250,000 pieces, 150,000 of the number being first-class mail, most of which required individual answers. This is an increase of more than 10 per cent over that of last year and of 50 per cent over that of 5 years ago. During the peak month of October when the school year is well under way, incoming letter mail totaled 15,000.

The office issued 114 publications distributed as follows: 41 bulletins, 11 pamphlets, 16 leaflets, 6 bibliographies, 23 miscellaneous, including handbooks, price lists, directories, etc., and 17 circulars. More than 455,000 free copies were distributed to libraries, to individuals who supplied data, and to persons particularly interested in the specific fields of the studies.

There has been phenomenal increase in School Life circulation. In June, 1931, the free distribution of School Life was 5,000, the subscriptions at the Government Printing Office, 4,794. In June, 1932, the free distribution was 1,500, the subscriptions, 9,817. This is the largest subscription list ever enjoyed by School Life at its present subscription rate and one of the largest distributions by fee enjoyed by any United States Government periodical information service.

The office has prepared informational exhibits of its work and of educational activities for a variety of occasions. The meeting of the department of superintendence of the National Education Association brought more than 10,000 leaders in education to Washington in February. An exhibit of Government services useful to schools was established in the lower corridor of the Interior Department. Fifteen Federal bureaus and the Office of Education displayed publications, maps, and other services to thousands of school officials. Exhibits of Office of Education publications and services were prepared for 15 other educational associations holding conventions.

This office by no means depends entirely upon Government publications as an outlet for the findings of its staff. Reports which have immediate news interest, those which are of interest to special groups, those which summarize the results of long, technical accounts have appeared in more than 35 journals during the year. Members of the staff made a total of 288 addresses before national, State, regional, and local groups.

THE GEOLOGICAL SURVEY

SUMMARY OF THE DIRECTOR'S REPORT

THE YEAR'S OPERATIONS

Among the outstanding publications of the year are Professional Paper 163, on the significance of geologic conditions in naval petroleum reserve No. 3 (Teapot Dome); Professional Paper 164, giving the results of a geographic and geologic reconnaissance of the Kaiparowits region, a large, little-known area in Utah and Arizona; Professional Paper 169, on the geology and ore deposits of the Bonanza mining district, Colorado; Professional Paper 172, on the gold quartz veins of the Alleghany district, California; Bulletin 833, on the mineralogy of drill cores from the potash field of New Mexico and Texas; and Water-Supply Paper 638-C, an outline of methods for estimating ground-water supplies.

A summary of the year's operations is given below.

GEOLOGIC WORK

The geologic work of the year was varied and widely distributed. It included economic and general studies of many mining districts in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, and Oregon; of lead and zinc deposits in Virginia; of iron ores in Alabama and the Lake Superior district; of coal fields in Montana, New Mexico, Oklahoma, and Utah; of oil fields and prospective oil and gas areas in California, Colorado, Mississippi, and Utah. Much of this work was carried on in cooperation with State surveys and other organizations.

The field work incident to the drilling of the last four wells of the 5-year potash exploration program was completed at the end of the year, but much laboratory and office work must still be done before all the stratigraphic and economic results of the investigation can be made available.

Areal mapping and stratigraphic, structural, and general geologic investigations were carried on in many areas in the Appalachian region, the Coastal Plain, and other parts of the country. Geologic work was done in 43 States in addition to the work of the volcanologic section in Hawaii, Alaska, and California.

EXPLORATIONS IN ALASKA

The work of the Geological Survey in Alaska, begun more than 30 years ago, is still in large part pioneer service under frontier condi-

tions, though airplanes are being used for transportation to some of the remote camps. In the field season of 1931 eight field projects resulted in the geologic mapping of 5,976 square miles, of which 1,986 square miles represented revision on a larger scale of earlier surveys, and the topographic mapping of 5,680 square miles, of which 1,037 square miles represented revision. The Bureau of Mines cooperated in one of these projects. Of the total area of Alaska 44.4 per cent has now been covered by geologic surveys and 47.3 per cent by topographic surveys. The broad survey of recent mining developments, the collection of mining statistics, and the supervision of operations under coal and oil leases on Government lands were continued. Progress in compiling drainage maps from the Navy Department aerial photographs added more than 1,000 square miles to the areas thus covered.

At the beginning of the fiscal year, work had been started on seven field projects chargeable to funds appropriated directly to the Geological Survey and 10 field projects undertaken under a special appropriation to the Alaska Railroad, to discover resources that may contribute to railroad tonnage, funds being transferred to the Geological Survey for this purpose. The railroad projects included examinations in 1 coal area, 5 gold districts, and 3 areas where the lodes consist mainly of mixed sulphides and a general investigation of nonmetalliferous deposits throughout the railroad belt. Cooperation in this work was furnished by the Bureau of Mines and the Alaska Road Commission.

Under the special appropriation to the Alaska Railroad contracts were let, in the spring of 1932, for core drilling in both the Moose Creek and Chickaloon coal areas to determine the areal extent and quality of coal in undeveloped portions of those fields. This work was carried out under direction of the Geological Survey.

TOPOGRAPHIC MAPPING

The topographic maps prepared as an essential base for detailed geologic mapping have proved to have hundreds of other uses, and the general realization of their value is shown in the increasing funds made available by States and other Federal units for cooperation in this work. The State cooperative funds during the year amounted to \$382,804.06 and were furnished by 15 States and 2 counties. Cooperation was furnished by the War Department in 8 States and by the Department of Justice in 1 State. The area mapped during the year amounted to 25,893 square miles, and the total area now mapped is 1,375,644 square miles. Ten States, the District of Columbia, and Hawaii are completely mapped, and the percentages in the other States range from 8 in Florida to 88.9 in Virginia. Of the continental United States, exclusive of Alaska, 45.2 per cent has been mapped. Office mapping from aerial photographs by stereophoto-

grammetric methods was completed for the Zion National Park and nearly completed for the Bryce Canyon National Park, both in Utah. An experimental project with a new 5-lens camera used at high altitudes, undertaken in cooperation with the Air Corps, United States Army, promises to reduce the amount of control needed. Maps were compiled and other illustrations assembled for publication in the George Washington Atlas.

INVESTIGATIONS OF WATER RESOURCES

The work on water resources consists primarily of the collection of facts in regard to the quantity, quality, availability, and utilization of water. The widespread interest in the availability of water for many uses has led to a persistent and increasing demand for reliable data that would serve as a basis for safe and sane developments. The work is done largely in cooperation with other Government organizations, with State, county, and municipal agencies, and with permittees and licensees of the Federal Power Commission. The amount expended by State, county, and municipal agencies for such work during the year, in part directly and in part through the Geological Survey, was \$548,337.64. This sum covered work in 40 States and Hawaii. Including the cooperative work, the study of surface waters, which consists primarily of the measurement of the flow of streams, was carried on in 48 States, the District of Columbia, and Hawaii, in which at the end of the year 2,791 gaging stations were being maintained. In this work 39 of the States cooperated. Investigations relating to ground water or power and reservoir sites were made in 25 States, 15 of which cooperated, and in Hawaii. Research into the principles of hydrology and cooperation with well drillers' associations have been continued. In the hydrologic laboratory 283 samples of water-bearing material were analyzed. The work on quality of water involved the examination of 1,025 samples of water. Studies of the dissolved and suspended matter in the Colorado River and its tributaries were continued. The investigations of power resources included the preparation of monthly and annual reports on the production of electricity and consumption of fuel by public-utility power plants, a report on the developed water power of the United States, and compilations of the stocks of coal held by electric public-utility power plants.

Studies of water utilization and flood control were continued and included investigations relating to the apportionment of water on international streams. Special field work was done in connection with 130 projects of the Federal Power Commission.

WORK IN CLASSIFYING AND LEASING PUBLIC LANDS

The classification of public lands with respect to their mineral, water power, and agricultural value and the technical supervision of mineral and power development on such lands and of mineral development on Indian lands were continued in 21 States and Alaska. The number of cases involving land classification acted on during the year was 12,913, and the results accomplished include net decreases of 816,873 acres in outstanding withdrawals for coal, of 54,100 acres in areas classified as oil-shale land, and of 115,293 acres in outstanding withdrawals for phosphate, and net increases of 508,480 acres in areas classified as coal and of 1,737 acres in areas classified as phosphate. At the end of the year the total area classified as mineral in character amounted to 36,889,563 acres in 14 States and Alaska, and the outstanding mineral withdrawals to 45,434,202 in 14 States. Definition of the "known geologic structure" of producing oil and gas fields was continued, and at the end of the year the net area so defined was 843,106 acres in seven States. Investigations to obtain information for classifying public land with respect to its value for the development of water power were made in four States. There was a net increase of 40,712 acres in the area included in power reserves, making a total of 6,577,185 acres in 21 States and Alaska, on which about 15,000,000 continuous horsepower can be developed. The net decrease in enlarged-homestead designations was 3,135,666 acres, making a total outstanding of 314,348,866 acres in 14 States, and the net increase in stock-raising homestead designations was 817,868 acres, making a total outstanding of 123,596,586 acres in 19 States. There was a net increase of 9,483 acres in public water reserves, and the total outstanding is now 447,836 acres in 12 States and Alaska. The supervisory work on public lands subject to the mineral leasing laws was increased by the issuance of 89 leases, 46 licenses, and 237 permits, covering 408,744.75 acres, and decreased by 1,304 cancellations and expirations of leases, permits, and licenses. The production of petroleum on such lands during the year was 26,454,217.11 barrels, of natural gas 50,876,816,000 cubic feet, and of gasoline 97,937,827.90 gallons, on which the royalty, rentals, and bonuses amounted to \$3,097,682.87. The production of coal on such lands was 2,880,448 tons, of phosphate rock 33,099 tons, of potash 45,967 tons, and of sodium salts 32,895 tons, on which the accrued royalty, rentals, and bonuses amounted to \$403,787.65. Supervision over oil and gas operations on naval petroleum reserves was continued, and the total production was 3,919,625.61 barrels of petroleum, 4,442,014,000 cubic feet of natural gas, and 18,539,144 gallons of gasoline, on which the royalty value was \$690,188.27. Inspectional, regulatory, and advisory service was rendered in connection with the leasing of mineral

deposits on Indian lands in eight States. In general, the demands for engineering advice and assistance are increasing as the supervisory duties under the leasing laws are more clearly defined and enlarged and as the competence and impartiality of the supervisors become more widely known.

PUBLICATIONS

The publications of the year consisted of 82 books and pamphlets of the regular series, 141 new or revised maps, 378 reprinted maps, and numerous circulars, lists of publications, etc. The numbers of books and maps issued showed increases from 1931 ranging from 74 to 97 per cent. The total number of pages in the new book publications was 11,238, an increase of 30 per cent. In addition to the publications in the regular series, 71 brief reports, a few of them accompanied by maps, were issued in mimeographed form as memoranda for the press. The publications distributed numbered 893,438, of which 3,877 folios and 547,746 maps were sold for \$34,737.32.

THE BUREAU OF RECLAMATION

SUMMARY OF THE COMMISSIONER'S REPORT

The area irrigated in 1931 with water from Government works was 2,846,607 acres, an increase of 55,751 acres over that of 1930.

The area cropped was 2,772,184 acres, a decrease of 33,276 acres.

The total value of crops was \$73,960,377, a decrease of \$45,701,443, compared with 1930; and of \$87,219,503, compared with 1929. This marked decrease in crop values was due largely to the agricultural depression and the prevailing low prices of crops.

During the period between 1906, when water was first available, and 1931, the cumulative value of crops grown on land irrigated from Government works amounted to \$1,835,889,877.

Construction payments in cash and credits from power and other sources received during the fiscal year 1932 were \$1,504,451.43, a decrease of \$3,290,381.89, compared with the previous year.

Payments for operation and maintenance were \$1,107,708.53, a decrease of \$318,429.51, compared with the previous year.

Total payments amounted to \$2,612,159.96, compared with \$6,220,-971.36 in 1931, a decrease of \$3,608,811.40.

Income to the bureau from all sources during the fiscal year was \$5,399,314.94, or \$4,968,351.62 less than in the previous year.

The operation expense for the year was \$1,449,189.74, a decrease from the previous year of \$286,595.17.

Excess of operation and maintenance expense over receipts for the period amounted to \$341,481.21, compared with an excess of expense over receipts of \$309,646.87 for the previous year.

The appropriation available for construction was \$8,415,000.

The amount expended on construction was \$7,255,188, compared with \$10,843,700 the previous year.

The 10-year construction program started in 1927 has been retarded by reason of reduced revenues coming into the reclamation fund; and unless some additional source can be found, it will be upward of 15 years before the original 10-year program can be completed. In addition to work heretofore authorized by Congress, there is urgent need for the construction of storage dams and reservoirs on many constructed and fully developed private projects. The Boulder Canyon project comes under a separate authorization, and appropriations for this work are made direct from the General Treasury. The bureau has expended for surveys and investigations, construction, operation

and maintenance, and incidental operations, \$272,800,000 distributed approximately as follows:

Surveys and investigations not allocated to primary projects.....	\$2, 800, 000
Construction of irrigation works, etc.....	223, 000, 000
Operation and maintenance.....	35, 800, 000
Incidental operations, plant and equipment, etc.....	11, 200, 000
Total.....	272, 800, 000

The relief act of April 1, 1932, granting to water users on Federal projects a suspension of payment of construction charges that became due in 1931 and one-half of the construction charge for 1932, resulted in a further reduction in reclamation revenues. Accretions to the revolving fund from the sale of public lands were \$430,444.15 and from oil leases \$1,429,272.09, which is a shrinkage of about one-third of the revenues received from these two sources in the previous fiscal year. As a result of reduced revenues, the appropriations available for carrying on work in the fiscal year 1933 are estimated as follows:

Direct appropriations.....	\$2, 414, 500
Unexpended balances continued available.....	1, 819, 000
Power revenues.....	325, 000
Funds to be advanced.....	624, 620
Total available.....	5, 183, 120

BOULDER CANYON PROJECT

Construction work on the Hoover Dam has been pushed at a rapid rate, and the contractors, Six Companies (Inc.), are fully six months ahead of their required progress, and are planning to construct the cofferdams and divert the Colorado River through the diversion tunnels during the winter of 1932-33, one year ahead of the date originally contemplated.

The contractor has erected a sand and gravel screening plant to prepare aggregates for the 4,500,000 cubic yards of concrete that will be required in constructing the dam, power plant, and appurtenant works. This plant, the largest of its kind ever constructed, has an initial capacity of 500 tons per hour, with provision for doubling this output if required. A standard-gage railroad has been constructed from the plant to the sand and gravel deposits on the Arizona side of the river about 8 miles above the dam site, with an 850-foot trestle bridge crossing the river. A low-level concrete mixing plant has been erected near the river, with a capacity of 280 cubic yards of concrete an hour.

The principal work accomplished under the Six Companies' \$49,000-000 contract was the excavation of the four 56-foot diameter diversion tunnels having a total length of 15,905 feet and involving the

excavation of 1,500,000 cubic yards of rock. These tunnels are being lined with 3 feet of concrete.

The principal contract awarded during the year covered the purchase of two 50 by 50 foot bulkhead gates and two 50 by 35 foot Stoney gates, together with hoists, at an f. o. b. factory price of \$287,725. At the close of the fiscal year bids were received for furnishing and installing 46,000 tons of plate-steel outlet pipes, comprising 30-foot diameter main headers, reducing to 25-foot diameter, with 13-foot diameter penstock pipes leading to the hydraulic turbines to be installed in the power plant. The Babcock & Wilcox Co. of New York submitted the low bid of \$10,908,000.

During the fiscal year Boulder City was transformed from a barren desert to a modern city of 5,000 inhabitants with paved streets, electric lights, water and sewerage systems, and electrically equipped homes. The measures taken to provide for the comfort and safeguard the health of the employees of the Government and contractors are fully justified and have resulted in a marked improvement in the morale of the men.

CONSTRUCTION ON RECLAMATION PROJECTS

The Owyhee Dam, Owyhee project, Oregon, at present the highest dam in the world, was completed and dedicated on July 17, 1932, and the Thief Valley Dam, Baker project, Oregon, was completed in June, 1932. The parapet wall of the Echo Dam, Salt Lake Basin project, was completed during the fiscal year, and the dam was dedicated on July 13, 1932. Plans and specifications were prepared for power and pumping plants, canal excavation, drainage work; gates and hoists for the Cle Elum Dam, and an elevator for the Owyhee Dam.

The construction of the Cle Elum Dam, Yakima project, Washington, is being continued under contract. Canal construction was continued on the Gooding division of the Minidoka project, and on the tunnels and canals of the Owyhee project, Oregon. Power and pumping plants were built on the Grand Valley project in Colorado and the Yakima project in Washington, respectively.

During the fiscal year, 156 miles of canals, ditches, and drains were completed, making a total of date of 17,623 miles. At the end of the fiscal year, the tunnels numbered 142, with a total length of 46 miles. Canal structures numbered nearly 168,000, of which about 2,500 were built during the year. The bureau has laid 4,712,000 feet or 894 miles of pipe. There were completed to date 1,477 miles of road, 120 miles of railroad, 4,044 miles of telephone lines, and 3,308 miles of transmission lines. The various construction activities have involved the excavation of 311,465,707 cubic yards of earth and rock.

In building dams and other irrigation structures, there have been placed 5,115,964 cubic yards of concrete, involving the use of 5,861,995 barrels of cement.

SETTLEMENT AND DEVELOPMENT

One hundred and forty-two public-land farm units were opened to entry during the fiscal year in Oregon, California, Idaho, South Dakota, Wyoming, and Montana. Throughout the year, there was a demand for farm homes on the projects, and many of the units were filed on by carefully selected settlers.

Federal reclamation projects comprise but a small percentage of the total productive area of the United States, but, small as it is, it has created 42,568 irrigated farm homes supporting a population of 177,281. It has created or added materially to the development of 227 project cities and towns, with an additional population of 514,425, in which have been built 723 schools, 778 churches, and 120 banks with deposits of \$116,484,236.

MORATORIUM

The economic depression has had its effect on Federal reclamation projects and the farmers on irrigated farms have had heavy taxes and other expenses to meet in addition to construction charges and operation and maintenance costs. The sharp reduction in the price of agricultural products made it, in many cases, impossible for the water users to meet these payments and, under date of April 1, 1932, Congress passed what is generally known as the "relief bill" which provided for a suspension of the payment of the 1931 construction charge and one-half of the charge becoming due in 1932, with the proviso that these deferred charges should draw interest at the rate of 5 per cent per annum until paid. As a result of this act, the money paid in to the revolving reclamation fund for the season of 1931 was cut down to about \$1,000,000, and it is expected that the cash payments for the season of 1932 will probably be somewhat less. As the result of this reduced income, the construction activities of the bureau have been limited principally to work on the canal system of the Owyhee project in Oregon and continuing work on Cle Elum Dam in Washington. There are some other small contracts in force, but the aggregate value is relatively small.

FUTURE NEEDS OF THE BUREAU OF RECLAMATION

Construction activities of the bureau have been confined in recent years to the completion of projects that were started several years ago. Urgent requests have been received from a large number of private projects completely settled and well developed, but where the water

supply has not been sufficient to irrigate some of the late season and most valuable crops produced, principally sugar beets and fruits. The bureau has investigated a large number of these projects and in several cases storage reservoirs have been constructed which will supply the additional quantity of water needed to put the projects on a more successful footing. The need for this work is far in excess of what can be accomplished by the limited amount of funds that are being returned to the Federal Government from repayments by the project-water users, oil royalties, and other miscellaneous receipts. There is an urgent need for about \$10,000,000 per year to be expended in the construction of additional storage works in the States of the arid section of the country where the farmers are operating under handicaps that do not exist in the humid section, but where there are requirements for agricultural products to supply the large communities in the Western States.

Power development as a factor in the future extension of reclamation.

At the time of the approval by President Roosevelt of the reclamation act on June 17, 1902, little, if any, thought had been given to the utilization of hydroelectric power except as an aid in lowering the cost of construction. In these early days of Federal irrigation, and, in fact, until recently, power plants were built by the bureau only when power could be used advantageously in canal construction or when a need was foreseen to pump water to high lands.

After the completion of construction there was naturally a trend toward a power consciousness on the part of the new settlers who found power lines stretching along the canal banks, inviting use as the main lines of a power distribution system reaching to the individual farms. Most water users were eager to avail themselves of the added comfort and convenience afforded by a hydroelectric development already started at their very doors. Growing industries in the project towns and beyond the project boundaries added their pleas for the purchase of power for private and municipal use.

When these plants began to be expanded or constructed, not primarily as an integral part of the irrigation system for construction and pumping, but for the profit which would result from building commercial power plants to provide an increasing source of revenue to help pay for the irrigation works, the question as to who was entitled to the net profits after the works were paid for assumed a very different and more important aspect. This question was given consideration by Congress and on December 5, 1924, the "Fact Finders Act" was passed, which provides in Subsection I of Section 4 as follows:

That whenever the water users take over the care, operation, and maintenance of a project, or a division of a project, the total net profits * * * derived from the operation of the project power plants * * * shall be credited to

the construction charge of the project or a division thereof, and thereafter the net profits from such sources may be used by the water users to be credited annually, first on account of project construction charge, second on account of project operation and maintenance charge, and third as the water users may direct

The net power revenues on the Strawberry Valley, Newlands, Minidoka, and North Platte projects are being credited to the water users in accordance with this act, and as a result the water users on these projects have been relieved of a very substantial part of their annual construction payments to the Government. The water users on the Minidoka project have elected to use their power profits to purchase additional storage, and to provide additional power-plant capacity and enlargement and betterment of the irrigation and drainage systems. The revenues from the siphon drop plant on the Yuma project are being distributed in accordance with special public notice agreements.

Since the act of December 5, 1924, Congress has passed special supplemental legislation under which the net power revenues from the Black Canyon power plant on the Boise project, from the Prosser plant on the Yakima project, and from the Shoshone power plant on the Shoshone project, are applied in accordance with the provisions of this special and more recent legislation, first, to the repayment of the cost of the power system; second, to the repayment of part or all of the cost of certain irrigation features; and third, after these costs are repaid the net revenues are to go to the reclamation fund. The net power revenues on the Riverton project are being applied in accordance with the policy adopted by Congress for the Black Canyon and Shoshone power plants, although there is no special legislation applicable to the Riverton project. On these projects the water users are relieved of repaying the cost of a part of the irrigation works, which are to be repaid out of power revenues, and after the cost of these features has been repaid, the reclamation fund will receive a substantial income which will be available for the construction of additional projects.

On one of these power-favored projects the net revenue from the sale of commercial power is larger than the contract payments required from irrigators.

Twenty hydroelectric power plants on 11 of our 29 Federal reclamation projects were in operation during the fiscal year 1931-32. These plants have a total installed generator capacity of 102,550 kilowatts, and they generated 331,739,500 kilowatt-hours of energy, of which 21 per cent was utilized for irrigation and drainage pumping, 65.4 per cent was sold for commercial and industrial uses, and the remainder, or 13.6 per cent, was used for miscellaneous purposes and consumed by losses. Eleven of these plants were operated directly by the water users, and nine, having a total installed gener-

ating capacity of 31,500 kilowatts, were operated by the Government. The following table shows the net power revenue for the fiscal year, the accumulated net power revenues from beginning of operations to June 30, 1932, and the disposition of the power revenues for the nine power plants being operated by the Government on Federal reclamation projects:

Results of power operations of power plants operated by Bureau of Reclamation

Project	Net power revenue, fiscal year 1931-32	Accumulated net power revenues to June 30, 1932	Remarks
Boise.....	\$89,940.38	\$352,970.60	Net power revenues applied to repayment of cost of Black Canyon power plant, one-half cost Black Canyon diversion dam and cost of Deadwood Reservoir.
Minidoka....	112,631.88	1,246,157.11	Net power revenues credited annually to Burley and Minidoka irrigation districts and used for purchase of additional storage, increasing water supply and power development, and drainage.
North Platte..	177,856.01	866,561.95	Net power revenues credited annually to 4 irrigation districts and other lands in proportion to acreage.
Riverton.....	-7,918.52	-35,035.09	Net power revenues applied to repayment of cost of Pilot Butte power plant, transmission lines, and portion of cost of main canal, diversion, and storage works.
Shoshone.....	31,425.99	263,988.61	Net power revenues applied to repayment of cost of Shoshone Reservoir and power plant.
Yuma.....	56,231.11	256,754.51	Net power revenues credited annually to construction charges on lands of Valley division. In 1932 these lands will receive a credit of \$1 per acre.
Total....	400,166.85	2,951,397.69	

The position of the bureau is that the profits from these power plants should be applied—

1. To the repayment of the construction cost of the power system.
2. To aid in repayment of the construction cost of the dam or other structure which creates or makes possible the power development.
3. To be covered into the reclamation fund to be used as other moneys in this fund in the construction of additional works.

The reason for this policy is that in every case these works have been wholly built at the cost of the Government. Irrigators under these projects have advanced no part of the money for their construction, and in some of the recent works have not obligated themselves to pay any part of the construction. Where they have obligated themselves such payments have not been required because the income from the power plant has more than met the repayments on its cost required by the Government. If the income from these power works is to be given to the water users under the projects, it will be made as a gift. The revenues will furnish a perpetual income for which no investment was made and which benefit is not shared by the irrigators on projects where power development is not possible.

Some of the more recent appropriation acts for certain projects have established this policy. It relieves the water users of the

obligation to repay part of the project costs which are to be repaid out of power receipts. Eventually after the costs of the power systems have been repaid the reclamation fund will receive substantial revenues from power which will enable reclamation work to proceed at a faster rate than would otherwise be possible. Water users on projects having power income and on projects having no power income would be placed on a more nearly equal basis.

It is hoped that the next Congress will enact legislation to determine the disposal of power revenues and that this claim of the water users on power plants to have these revenues as a profit on the investment made by the Government will be finally disposed of.

Whether there should be some restriction which would give the State where the power plant is located the preferred claim on those revenues to be used in reclamation in that State is worthy of consideration. But the main thing is that these profits will lighten the burden on irrigators in the building of works of high acreage cost in the future. Without such a remedy many of the most valuable works will not be financially feasible.

A reclamation policy for the immediate future.

The Reclamation Bureau is confronted by two conflicting conditions. One is that causes heretofore referred to have created a large shrinkage in the reclamation income. The total construction income of the reclamation fund for 1933 is about \$3,000,000. For 1934 it will be about \$4,000,000.

The 10-year construction program adopted in 1926 contemplated an expenditure of \$10,000,000 a year from income and on a \$10,000,000 yearly expenditure it would require 10 years to complete the projects already under construction or authorized by Congress. To carry out this program with the present income will double the time contemplated. All the money available for 1933 or 1934 could be profitably spent on a single reservoir.

With the fund thus depleted we are confronted, on the other hand, with requests in greater numbers than ever before for investigations looking to the rebuilding of older irrigation canals or the construction of reservoirs to increase the water supply. These requests are not for investigations to determine how unpeopled desert land can be reclaimed but to determine how the people living in old-established irrigation districts and on highly improved farms can obtain a water supply sufficient for their needs.

The shortage of water in fully settled districts has been made more serious by changes in economic conditions in the West. When the reclamation act was passed 30 years ago the great problem of private development was to get water out of the streams onto unpeopled desert lands. In that work immense sums of money, raised

by the sale of bonds or contributed by incoming settlers, were used to build works. Reduction in first cost was an important consideration. For a considerable time after the passage of the reclamation act the area of desert land reclaimed by private and district works far exceeded that supplied with water from Federal projects.

The Reclamation Bureau supplemented this private development with larger, costlier, and more permanent works. Many of these first works were built to rescue private projects. Now, 30 years later, irrigation is confronted with the fact that development by private enterprise has ceased because it is unprofitable, while the growth of population has made a great increase in the use of water. Take, for instance, the city of Los Angeles. It has absorbed the irrigation water of the Owens River Valley. It has made large inroads on irrigation supplies in near-by valleys and is now compelled to go to the Colorado River to obtain the water essential to its future growth. Sacramento, Salt Lake, and Denver, as they have grown, have required additional water. This water comes in part from water originally appropriated for irrigation.

Changes in the economic life of the arid region are increasing the consumption of water. To meet this, works for conserving flood waters must be built. More people and higher standards of living are changing the practices of irrigated farming. They have created a market for crops that can only be grown by skillful cultivators and through costly methods. Acres that were once in grain are now devoted to orchards and market gardens. These new and costlier crops require more water for late irrigation than the grain and hay crops of the pioneer. The older irrigation works, where the main idea was to build cheaply, do not meet these exacting requirements. Some are too small, some are unsafe, and must be rebuilt, and, above all, there are few valleys where additional reservoirs are not a necessity.

The districts confronted with this situation are not able themselves to raise the money for these improvements nor can they obtain it from private loans. Private and district irrigation development have almost ceased. There is no present market for irrigation bonds. Few of the arid States are financially able to aid in the reconstruction of these works and a majority are prohibited by constitutional limitations. Irrigators therefore look to the Federal Reclamation Bureau for rescue.

Some of the older developments are faced by water shortages due to the larger use of early priorities. The people along a river like the Arkansas, the Platte, or the Snake are bound together by their common tie of dependence on the river. In the early days when rights to water were being established the future significance of this was not realized and the earlier rights gave titles to more water than

had actually been used, the idea being that they would provide for any ultimate requirements later on. The right to sell these priorities was upheld by the courts of some States, and so, either through sales and transfer to other lands, or the enlargement of the area irrigated under the original works, the consumption of water controlled by early rights absorbs the entire natural flow and thus, takes it away from farms once irrigated under later rights.

To meet this situation and prevent the wholesale impoverishment and abandonment of highly improved farms the Bureau of Reclamation is being called upon to work out programs for protecting and preserving existing developments. Some of the most urgent appeals come from areas like the San Joaquin Valley in California, the Salt Lake Valley in Utah, and the Platte and Arkansas Valleys in Colorado, Wyoming, and Nebraska. Any proposal to provide additional funds to meet these needs is met by opposition. Many who do not understand conditions believe that it would increase the agricultural surplus and they seek to place an embargo on all further conservation of water for irrigation. Newspapers carry headlines "Reclamation a Detriment," "Grange Opposes Irrigation Projects," and in these discussions all irrigation canals are treated as evils, every reservoir as a menace, and the cropgrowing irrigator as a public enemy. This attitude comes from lack of understanding of western conditions and a mistaken belief that the main result of the works desired would be to add new land to the cultivated area and increase the agricultural surplus. No one in the West desires this. What is sought is to preserve farms already established, to complete development already begun and on which large sums of money have been spent, and to save to the men living on western farms the fruits of their expenditures and their toil.

Increase in the irrigated area would be so insignificant that it would have no perceptible influence on the total crop production of the country. Some land would necessarily be added to the irrigated area within a district, but it would be so small in amount that it would not injuriously affect any part of this country. This fear of injurious competition with existing farms will disappear when the operations of the bureau are better understood, when it is realized that the increase in irrigated products for the past five years has not kept pace with the increased demands for these products in western cities. Western industries are growing faster than western farms, and that growth makes the cities an invaluable market for eastern factories and eastern products. The prosperity of the West causes a reflex prosperity in the East, while crop losses growing out of defective water supplies, the abandonment of farms, decline of population in western irrigated valleys must cause an economic loss to both western cities and eastern factories. So far as crops are concerned,

the loss of these farms or their preservation will not affect the surplus problem of the whole country.

Because of the character of the opposition to irrigation, public opinion instead of being informed is being misled. The suffering from recurring water shortages is not realized, and there is danger that many families will be impoverished and farms abandoned before the real situation is understood. If farmers in the humid parts of the country were faced with a situation where they could not count on rain after July, they would more readily understand the needs of these pioneer communities which seek reservoirs to supply them with water during that period.

The question is: What ought to be done? It is a situation which primarily concerns the West and which can be improved only by the active influence of an aroused public opinion. The mistaken apprehensions of harm need to be removed by argument, persuasion, presentation of facts. That there should be more interest in this matter by the Western States as a whole is apparent to anyone who understands the present situation. The National Government thus far has done everything. It has furnished the money, recommended the appropriations, and defended the results. The Western States have been the beneficiaries, present and prospective. What, then, should the Western States do to support and assist in this great work? It involves a question of State cooperation and support of national irrigation. The spirit of cooperation exists; the question is: How can it be shown and made effective? No means should be neglected for insuring the continuation of this work. How can the humid sections of the country be convinced that reclamation is really a business enterprise, that it is the desire of both irrigators and the Western States that the money advanced shall be repaid?

The conditions of repayment required under our Federal reclamation laws are more liberal than those of any other country. While government construction of reclamation works is a national policy in every arid country, the United States is the only one which does not require the payment of interest on the money advanced. Because of this generosity and because the money goes wholly to the upbuilding of one section of the country there is a special obligation resting on the Western States to see that the contracts made for repayment shall be fulfilled, except where conditions make this economically impossible, and where they would justify relief in any section of the country. If the subject is approached in this attitude, it is believed that the money needed to complete half-built works, the money needed to rescue communities from the losses and disappointments of an inadequate water supply, will be provided, and the Reclamation Bureau can, in the next 10 years, be made a greater instrument for the upbuilding of the West, city and country, than ever before.

Projects turned over to water users.

Under the policy of decentralization and local control 20 projects or divisions of projects have been turned over to the water users' organizations for operation and maintenance, as shown in the following table:

Project	Year	Remarks
Salt River project, Arizona.....	1917	Association operating entire project.
Uncompahgre project, Colorado.....	1932	Do.
Boise project, Idaho.....	1926	United States operating reserved works; board of control operating transferred works.
King Hill project, Idaho.....	1926	District operating entire project.
Minidoka project, Idaho:		
Gravity division.....	1917	United States operating reserved works.
South Side pumping division.....	1926	Do.
Huntley project, Montana.....	1928	District operating entire project.
Sun River project, Montana:		
Fort Shaw division.....	1927	} Do.
Greenfields division.....	1931	
Lower Yellowstone project, Montana-North Dakota.....	1932	Districts operating entire project.
North Platte project, Nebraska-Wyoming:		
Interstate division.....	1926	United States operating reserved works.
Northport division.....	1927	Do.
Fort Laramie division.....	1927	Do.
Newlands project, Nevada.....	1927	District operating entire project.
Umatilla project, Oregon.....	1926	Districts operating entire project, except McKay Reservoir.
Salt Lake Basin project, Utah: First division...	1932	Association operating entire project.
Strawberry Valley project, Utah.....	1927	Do.
Okanogan project, Washington.....	1929	District operating entire project.
Shoshone project, Wyoming:		
Garland division.....	1927	United States operating reserved works.
Frannie division.....	1930	Do.

The projects shown in the following table will be turned over to the water users for operation at an early date:

Project	Year	Remarks
Grand Valley project, Colorado.....	1937	Contract executed.
Milk River project, Montana.....	1936	Certain works to be reserved.
Vale project, Oregon.....		Project will be transferred upon completion of construction.
Owyhee project, Oregon-Idaho.....		Do.
Belle Fourche project, South Dakota.....	1934	Contract executed. Entire project will be transferred.
Yakima project, Washington: Kittitas division.	1933	Contract executed.

THE NATIONAL PARK SERVICE

SUMMARY OF THE DIRECTOR'S REPORT

Travel to the national parks and monuments during the past year showed an increase of 209,740 persons. This was due largely to the use of the newer eastern areas. A growing popular interest in our historic places was shown by the increased number of visitors to the Colonial and George Washington Birthplace National Monuments, and the Great Smoky Mountains National Park also appealed strongly to popular interest. At the Colonial National Monument for instance, with no travel listed a year ago, in 1932 there were 400,000 visitors, 225,000 of whom attended the 4-day sesquicentennial celebration at Yorktown last October, shortly after the beginning of the travel year.

Eliminating the travel increase to these areas, there is a decrease in both national park and national monument travel. These decreases are amazingly slight, however, when examined in the light of economic conditions and the drop in tourist travel generally. The fact that the parks and monuments last year entertained 3,754,596 people shows that these areas serve a very definite and useful purpose in our national life and are as important in periods of depression as in times of prosperity.

Increased winter use of national parks and monuments.

A keen interest was displayed in the winter use of the national parks and monuments this past year, and new and better highways and up-to-date snow-removal machinery made possible increased use of these areas during the winter months. It is essential that plans for the future development of the parks and monuments include serving large numbers of winter travelers.

Important park anniversaries.

Yellowstone National Park, the first national park to be established anywhere in the world, on March 1, 1932, celebrated the 60th anniversary of its creation. At Hot Springs National Park, celebration was held of the 100th anniversary of the setting apart of the Hot Springs Reservation on April 20, 1832, under one of the earliest conservation measures passed by the Congress of the United States. While Hot Springs was not made a national park until 1921, it has been managed along park lines since 1877.

Memorial plaques to Stephen T. Mather.

Memorial tablets to Stephen T. Mather, first director of the National Park Service, were presented to the service by the Stephen

T. Mather Appreciation and were installed in nine national parks and two national monuments, as well as in the Washington office in the Interior Department Building. Other plaques later will be placed in seven additional parks. Plaques also were furnished by the Mather Appreciation to the Sand Dunes State Park in Indiana, the Palisades Interstate Park in New York and New Jersey, and the Mather Memorial Parkway in the State of Washington. Most of the park and monument tablets were unveiled and dedicated on July 4, Mr. Mather's birthday.

Exceptionally interesting memorial services, conducted by the Bohemian Club of San Francisco, were broadcast nationally on July 10, at the time the plaque in Sequoia National Park was being dedicated.

Changes in park and monument system.

The total area of the national park and monument system was increased from 12,119,579.64 acres to 12,592,316.21 acres through the inclusion of the Bandelier National Monument in New Mexico and the Great Sand Dunes National Monument in Colorado, and the extension in area of the Acadia, Crater Lake, Great Smoky Mountains, Mount McKinley, Rocky Mountain, and Yosemite National Parks and of the Colonial, George Washington Birthplace, Petrified Forest, and Scotts Bluff National Monuments.

Private land acquisitions.

A definite program for eliminating alienated lands within national parks and national monuments was worked out during the year and excellent progress made in assembling the necessary preliminary data. Although no new funds were carried in the 1933 appropriations for the purchase of private lands, several transfers were completed from money previously appropriated, as well as under exchange acts and by gift. Acquirements during the year from all sources amounted to 21,065.29 acres.

Acquisitions of private holdings during the year included 2,516.32 acres in Glacier National Park; 4,237.17 acres in Rocky Mountain National Park; 100.77 acres in Wind Cave National Park; 640 acres in Yosemite National Park; 679.15 acres in Zion National Park; and 12,792.80 acres in the Petrified Forest National Monument.

Of the above, 12,792.80 acres were acquired by exchange, 7,533.41 acres by purchase, and 739.08 acres by donation.

Pending boundary problems.

Proposed national park and monument boundary adjustments involving national-forest lands were discussed during the year with the Forest Service. Agreements were reached in some cases, while further studies and adjustments are indicated in others.

Pending projects of importance included adjustments of the boundaries of Carlsbad Caverns, Grand Canyon, Grand Teton, Rocky

Mountain, Yellowstone, and Yosemite National Parks, and the giving of national-park status to the Kings Canyon country, either as a separate park or as an extension to Sequoia National Park. It is imperative that action be taken on this latter project in the near future, as the completion of new roads will soon enable visitors to enter the Kings Canyon in large numbers. Proper provisions must be made to take care of these visitors and to prevent disturbance of natural conditions through unregulated recreational use.

Eastern park projects.

The Great Smoky Mountains National Park, already established in a limited way, was enlarged by the addition of 138,843.20 acres of land, deeds to which were presented to the United States by the States of North Carolina and Tennessee on November 2, 1931. These deeds are now being reviewed in the Office of the Attorney General.

Additional lands have since been acquired by the two States, and in North Carolina only one tract remains to be purchased. The State of Tennessee during the year granted additional legislation to condemn, if necessary, all areas within the Tennessee section of the park boundaries.

During the year by congressional legislation the minimum area necessary for the establishment of the Shenandoah National Park was reduced to 160,000 acres. Efforts are now being made by the State of Virginia to secure the lands, which it hopes to turn over to the United States for park purposes within the current fiscal year.

The status of the Mammoth Cave project has not changed during the past year. The Mammoth Cave National Park Association has continued with the acquisition of lands within the designated boundary lines.

The commission appointed by Governor Brucker of Michigan to acquire Isle Royale as a national park is organizing its facilities and data pertaining to the land status before starting an active acquisition campaign.

A bill for the establishment of the Everglades National Park passed the Senate during the last session. It is hoped that it will receive favorable consideration in the House of Representatives during the forthcoming short session.

Research and education.

Excellent progress was made in educational and research developments. Naturalist service was extended to Acadia and Carlsbad Caverns National Parks and expanded in other areas.

There was increased public interest in all phases of the educational work. Especially noticeable was the enthusiasm displayed for longer trail trips, particularly all-day hikes.

Valuable assistance was rendered by the Educational Advisory Board in the solution of various educational problems. Park matters considered by the board included visual education, the use of native Indians to show craft work, innovations in museum display, and historical developments.

The scope of the various guided field trips was extended by the addition of several new types of service. Among these were the assignment of a ranger naturalist to accompany privately operated airplane flights over the Grand Canyon, a sunrise morning trip over the hot springs formations and an evening automobile game-stalk caravan in the Yellowstone, and a sunrise breakfast caravan to the summit of Cadillac Mountain in Acadia.

The lecture program was expanded primarily in the direction of informal camp fires in the various auto camp grounds. At three camp fires conducted in one national park about 1,500 people gathered nightly throughout the season.

Several new park and monument museums were opened to the public during the past season, including those at the Petrified Forest and Casa Grande National Monuments and the Sinnott Memorial at Crater Lake. The installation of exhibits at the Fishing Bridge Museum in Yellowstone National Park is nearing completion, and this will mean the completion of the series of trailside museums planned for that park, made possible by the support of the Rockefeller Foundation through the American Association of Museums. Two other interesting museum developments are the installation of exhibits in the historic Moore House in the Colonial National Monument, where were drawn up the articles of capitulation after the Battle of Yorktown, and the opening to the public of the MacCurdy Wayside Museum of Archeology situated near Lipan Point in the Grand Canyon. This latter museum acts as an index to the near-by excavated Tusayan pueblo ruins.

Use of the national parks and monuments by university classes, particularly in ecology and geology, increased. The Hawaiian National Park Summer School, the summer field course of the University of Hawaii, was a cooperative project, the park naturalist staff furnishing a large part of the field instruction.

The eighth session of the School of Field Natural History was held in Yosemite National Park. It is interesting to note that a graduate of the 1931 class of the Yosemite Field School was placed in charge of the new educational work in Acadia Park during the past season and two other graduates of last year served as ranger naturalists in Glacier National Park.

Numerous scientific investigations and studies were conducted during the year, most of them for the purpose of park protection or for the benefit of the visiting public, with a few others purely scientific

research projects. In the latter class were the cosmic-ray investigations made in Hawaii and Mount McKinley National Parks and the studies of Yellowstone geology and of the Yosemite granite. In the former class were studies of forest conditions and plant diseases, investigations of fishing conditions, and general plant and animal studies. Many scientists of note cooperated in these research projects.

Animal conditions and studies.

The wild-life research group continued its studies gathering scientific information on the most pressing animal problems confronting the National Park Service. Through securing the necessary appropriations, the service was enabled during the year just ended to bear nearly half the expenses of the wild-life survey. Previously all expenses of the work, which had been in progress two years before governmental assistance became possible, were borne privately by a member of the research group who unselfishly inaugurated this important work. The season's work included bird and mammal studies in Mount McKinley, and investigations relating to the trumpeter swan, pelican, bear, and other animal problems in the Yellowstone. A preliminary report of the wild-life research group is now in press.

The cooperative elk survey by William Rush, supported by the Bureau of Biological Survey, Forest Service, Montana Fish and Game Commission, and the National Park Service, was brought to completion. The findings of this survey have been valuable in establishing a management policy to govern the great game herds of the Yellowstone.

An airplane census of the southern Yellowstone elk herd, which winters in Jackson Hole, was made by the Forest Service, and showed the herd to be larger than heretofore reported. The Biological Survey continued studies of this herd, and a committee from the Campfire Club of America made investigations of game conditions in Wyoming.

Wild-life conditions in the parks continued favorable throughout the year. Despite severe conditions, the Yellowstone game and the deer in the other western parks wintered with only minor losses.

The situation of the mule deer on the Kaibab Plateau, adjacent to the Grand Canyon National Park, continues precarious, with the stock of deer there admittedly at a low ebb.

The bear situation in the Yellowstone is the subject of serious study. Artificial feeding of these animals has rendered many of them unduly aggressive in demanding food, and control measures already have been instituted.

Improvement in fishing conditions was marked, with a larger catch per capita of visitors than ever before reported.

The Bureau of Fisheries of the Department of Commerce continued to cooperate with the National Park Service in fish-cultural activities through the detail of a district supervisor to supervise such matters

in the western national parks, and also through making surveys and furnishing large quantities of stock for planting. State fishing authorities also cooperated by supplying trout fingerlings for planting in several parks not supplied by Federal hatcheries.

Protection of park forests.

Serious menaces to park forests through disease and insect infestation have been receiving intensive study. The worst problem faces the National Park Service in the Yellowstone, where the mountain pine beetle threatens the destruction of the lodgepole pine that constitutes about 80 per cent of the park forests. Experts of the Bureau of Entomology and of the Park Service report that there appears to be perhaps a 50-50 chance of saving these lodgepole pines if a 5-year program of control could be undertaken immediately, at a probable cost of from \$3,000,000 to \$5,000,000. The matter was discussed with the Appropriations Committee of the House of Representatives a year ago and is fully covered in the hearings. During these discussions it was decided that such an expenditure could not be justified at this time, particularly in view of the fact that even with it the saving of the trees was problematical.

Another serious insect infestation exists in the forests of Yosemite and Sequoia. It is particularly critical in the Yosemite, where the great sugar pines recently purchased jointly by John D. Rockefeller, jr., and the Government are threatened by a pine-beetle infestation. Preliminary work has been undertaken, and adequate control measures are imperative.

Another menace to park forests is the white-pine blister rust, which now is coming into the Northwestern States from Canada. Already it has appeared in Mount Rainier National Park, where control measures last year resulted in the saving of selected stands of white pine.

In connection with all insect and tree-disease control in the national parks, the greatest need of the National Park Service at the present time is for type map surveys, to show the various types of forests in the parks, to what disease or infestation they are subject, and the cost of preventative and control measures.

Preservation of park landscape.

During the past year the landscape architectural division of the National Park Service embarked upon the largest scale of future planning yet undertaken.

Important progress was made in the preparation of a master plan for each national park, based on development outlines prepared by the park superintendent. These master plans will be of great assistance to the superintendents in preparing their 6-year advance program in accordance with the employment stabilization act and will assure to each park a well worked out and properly coordinated plan

of development. The engineering division of the service supplied a great deal of basic data for these master plans, which show the entire development scheme and road and trail systems, fire-control plans, developed and special area plans, general layout for each tourist, parking, and administration area, utilities' plans for each community, relocation and arrangement of future buildings, and drawings to illustrate a special type of wall, guard rail, or other desired detail for a special location.

Major engineering projects.

Outstanding among the major engineering projects supervised by the chief engineer's office were the elevator construction at Carlsbad Caverns National Park, where the single-lift trip of 750 feet from floor of the cave to surface is made in slightly more than one minute; the completion of the hot-water-collection system at Hot Springs, started in 1931; the electrical generating and distributing system at Sunrise in Mount Rainier National Park; deep-water well-drilling operations and power-line installation in Mesa Verde; and reconnaissance surveys for the proposed relocation of the Big Oak Flat and Glacier Point Roads in Yosemite.

Eastern engineering division established.

An eastern engineering division was established to supervise civil engineering work in the national parks and monuments of the East, including Hot Springs, and to make advance engineering plans for eastern park and monument projects. This division is in charge of an assistant chief engineer.

The eastern division of the landscape architectural division, established a year ago, was expanded during the year.

Park road development.

The National Park Service was placed on a parity with other Federal road-building organizations by the requirement of securing 2-year authorizations in advance of appropriations. The authorization for appropriations to construct roads and trails in national parks and national monuments for the first time was contained in the general authorization bill for roads which is considered by both the House and Senate Roads Committees. The general authorization bill containing legislative provision for authorizations during the fiscal years 1934 and 1935 was passed by the Senate but not by the House, and consequently awaits consideration at the December session of Congress. Authority is contained in the pending law to contract in advance for road work in national parks and national monuments as now operative under the forest highway and Federal-aid appropriation acts. Such authority is essential to the most orderly and economical procedure in the placement of contracts for road construction.

During the 1932 fiscal year, ended last June 30, the cash for road and trail work amounted to \$7,500,000 as compared with an appropriation of \$7,078,800 in 1931. In addition, authority was given the Secretary of the Interior to obligate by contract on construction projects an additional amount of \$2,850,000 in 1932 and \$2,500,000 in 1931.

The regular 1933 appropriations for road construction in the national parks and monuments amounted to \$4,500,000, and another \$3,000,000 became available through the emergency relief and reconstruction act. Additional authority also was given the Secretary of the Interior in the Interior Department appropriation act to incur obligations up to a total of \$2,500,000. This was offset by the fact that obligations of an equal amount had been incurred in the previous year, to be paid from the regular 1933 appropriation of \$4,500,000 for road construction.

As in past years, the Bureau of Public Roads of the Department of Agriculture continued its excellent cooperation in major road construction. In Mount McKinley National Park, Alaska, similar work was performed by the Alaska Road Commission.

Notable progress in road construction was made during the year. Among the outstanding projects were:

Acadia.—Surfacing of scenic Cadillac Mountain summit road completed and road dedicated.

Colonial.—Progress made in construction of Colonial Monument parkway, with three bridges placed under construction.

Glacier.—Grading of the spectacular Transmountain Road approaching completion.

Great Smoky Mountains.—Surveys started and contract to be let early next year for construction of the first section of a ridge road extending from Newfound Gap toward Deals Gap.

Mount Rainier.—East Side Highway placed under construction at three points, assuring expedition in the construction of this most important highway connecting Paradise Valley and Yakima Park.

Petrified Forest.—Rio Puerco Bridge and north and south approach road completed, assuring access to the forest at all times of the year.

Rocky Mountain.—Magnificent Trail Ridge Road completed and opened to travel.

Shenandoah project.—Grading of a section of the Skyline Drive down the summit of the Blue Ridge Mountains in central part of proposed park area completed.

Yosemite.—Completion of the Wawona Tunnel, 4,200 feet in length, contracting for surfacing of the entire Wawona Road, and beginning of reconstruction of Chinquapin-Glacier Point Road.

All together there have been constructed, reconstructed, and improved to date (cleared, graded, and surfaced) 361.32 miles of roads. In addition, work in various stages of construction includes 430.92 miles of clearing and grading, and 260.37 miles of surfacing. Considerable progress has been made on construction of adequate trail systems, \$1,687,720.71 having been expended since 1925 on the construction of 732.04 miles of trails built of suitable standards and alignment.

Experiments in radio communication.

Interesting experiments are being carried on in Mount Rainier National Park in connection with the use of radio for communication between park headquarters and isolated ranger stations and with fire camps engaged in the suppression of fires. The University of Washington has cooperated in this work by placing the personnel and the apparatus of its scientific research and general engineering departments at the disposal of park authorities.

The object of these studies has been the development of a portable radio which will both send and receive voices and still be sufficiently light in weight to pack on horse or mule back. This would provide a very effective aid in forest-fire fighting and in game-patrol work. At this time, however, experiments do not justify any conclusion that radio will take the place of telephone communication in high mountain areas. It appears to be an excellent supplementary means of 1-way communication, and results justify continuation of the experimental work.

Appropriations and revenues.

The appropriations for the National Park Service for the fiscal year ended June 30, 1932, totaled \$12,831,250. Those for the 1933 fiscal year, under which operations are now being conducted, amounted to \$10,640,620, of which amount \$7,640,620 was authorized in the Interior Department appropriation act and \$3,000,000 in the emergency relief and construction act of 1932, approved July 21.

Under the provisions of the economy act, transfers from the appropriation "Roads and trails, national parks," to enable certain other bureaus of the department to meet their most urgent expenses, were made as follows: To the General Land Office, \$150,000; Geological Survey, \$284,400; and Office of Education, \$30,000.

Despite country-wide unfavorable economic conditions, there was derived from the operation of the national parks and monuments a total income of \$820,654.19, as compared with \$940,364.79 a year ago.

Public utility service.

The Director of the National Park Service expresses serious concern over the lack of patronage of the hotels and transportation lines operating in the national parks. These operations, carried on under

Government supervision, have suffered severe losses, largely because of the decline in rail travel, so that several of them are in dire financial straits. To assist as much as possible in this emergency, the service encouraged and occasionally suggested changes in types of service, special rates to encourage longer stays, and measures to attract patronage. To conserve utility-operator resources and reduce losses, curtailment of service was permitted and some plants were authorized to be closed when it became apparent that the public demand for such facilities did not justify their availability during the entire season.

During the past few years there has been a definite trend toward the lower-priced type of accommodations. Housekeeping cabins have exercised a particular appeal to private-car tourists. Plans are now under consideration to meet this demand, through the modernization of existing plants and new developments along this line where no provision has heretofore been made for this class of travel. Experience has shown that the financial returns from these operations are attractive and that the public will patronize them.

Canadian-United States international peace reserves.

The establishment of the Waterton-Glacier International Peace Park, by proclamation of President Hoover on June 30, 1932, marked a new step in international relations, and had for its purpose the commemoration of the century-long relationship of peace and good will existing between the peoples and the governments of the two countries. The international peace park was dedicated on June 18 at Glacier Park, Mont.

For purposes of administration the component parts of the peace park will each retain its nationality and individuality, while together forming one great international reserve for the use of the peoples of the two countries.

Equally interesting, although not a Government project, was the establishment of the International Peace Garden, located in the Turtle Mountain region of North Dakota and the adjoining Canadian Province of Manitoba. The site for this project was chosen as being near the geographic center of North America, far from commercial centers, yet readily accessible to the peoples of the two countries. The International Peace Garden Association plans to finance the garden entirely by private subscription, and it is understood that eminent landscape gardeners on both sides of the international boundary have volunteered their services in laying out the garden.

State park developments watched with interest.

The National Park Service continued in close touch with the State-park movement, chiefly through the National Conference on State Parks which was established in 1921 by former Director Stephen

T. Mather. These areas, which supplement the national park and monument system, were near-at-home outing places for nearly 50,000,000 persons, and performed an exceptionally valuable function for the American people at a time when limited budgets compelled economy in expenditures for vacations.

Recommendations of the director.

In closing his annual report, the Director of the National Park Service stresses the following recommendations, as essential to the broader usefulness of the national parks and monuments in the future:

1. That all Federal park activities be consolidated under the National Park Service, the bureau of the National Government established by law for this purpose. This would include the transfer of the military parks and monuments, as agreed upon for several years past by the Secretaries of War and Interior.

2. That the boundaries of several existing national parks be rounded out to take in areas needed for administrative purposes and more particularly to include and protect priceless scenery.

3. That pending legislation be passed for the creation of a national park trust fund board, to give necessary authority for the administration of gifts or bequests of funds and securities, the income of which may be applied for accomplishment of national park purposes.

THE TERRITORIES

TERRITORY OF ALASKA

SUMMARY OF THE GOVERNOR'S REPORT

The Governor of Alaska, Hon. George A. Parks, in his report for the fiscal year ended June 30, 1932, shows that economic conditions were not as satisfactory as they were during the preceding year. Fishing, the major industry of the Territory, was adversely affected by a decline in output, and by unfavorable conditions existing in regions which heretofore absorbed the products of the fisheries. Furthermore, the low prices of metal and lumber discouraged the production of such commodities and deprived many people of customary employment. A survey of conditions in the larger communities disclosed an unusual number of unemployed. The situation was aggravated by an influx of workers during the summer. Concerted efforts were made to discourage this class of immigration but nevertheless in each community there are an unusual number of people without means of support.

The population of Alaska according to the Fifteenth Census (1930) was 59,278, representing an increase of 4,242, or 7.7 per cent, as compared with the population of 1920. The gross area of Alaska, land and water, is stated to be 586,400 square miles. The average number of inhabitants per square mile in 1930 was one-tenth of one as compared with less than one-tenth of one in 1920. The following table shows the population of Alaska from 1880, the year in which its area was first enumerated, to 1930, together with the increase during each census period.

Census year	Population	Increase over preceding census		Census year	Population	Increase over preceding census	
		Number	Per cent			Number	Per cent
1930.....	59,278	4,242	7.7	1900.....	63,592	31,540	98.4
1920.....	55,036	-9,320	-14.5	1890.....	32,052	-1,374	-4.1
1910.....	64,356	764	1.2	1880.....	33,426	-----	-----

A minus sign (-) denotes decrease.

The report of the Collector of Customs for the fiscal year 1931, discloses a decline of about 16.7 per cent in the total commerce as compared with last year. Exports decreased \$8,511,905, or 14.9 per cent, and imports were \$5,238,010, or 20.2 per cent less. Total exports

were \$48,306,407 and imports \$20,599,693, with a balance of trade in favor of Alaska of \$27,706.77. Similar statistics for last year were: Exports, \$56,818,375; imports, \$25,837,703; balance of trade, \$30,980,-672. The greatest decline in any item was in the copper production, which decreased almost 65 per cent.

The report of the Territorial treasurer showed a balance of \$561,-662.43 June 30, 1932, as compared with \$694,894.93 last year. The combined resources of the Territorial and national banks on the same dates were approximately: Capital, \$890,000; surplus and net undivided profits, \$787,500; deposits, \$10,331,700; while approximate totals for the year previous were: Capital, \$915,000; surplus and net undivided profits, \$826,800; deposits, \$11,275,000. The total assessed valuation of incorporated towns was \$27,155,357 in 1932, as compared with \$26,745,956 in 1931.

The act of January 27, 1905, provides that revenues derived by the Federal Government from business and trade licenses shall be returned to the Territory. This is known as the "Alaska fund." Sixty-five per cent is available for construction of roads and trails outside of incorporated towns; 25 per cent is allotted for schools; and 10 per cent is disbursed for the relief of destitution by the Federal judges. During the year \$189,348.83 was available for distribution under this act.

By the act of Congress approved June 30, 1932, the powers and duties theretofore exercised by the board of road commissioners in the Territory of Alaska, and the Secretary of War, were transferred to the Secretary of the Interior for administration.

The total value of the fisheries products, exclusive of aquatic furs, was \$33,594,752, a decrease of \$4,084,297 from 1930 when the value was \$37,679,049. These figures represent the value of manufactured products. It is estimated that the value of the catch to the fishermen was approximately \$10,043,000 or about \$2,000,000 less than last year. The round weight of the salmon catch landed by the fishermen was approximately 467,664,391 pounds and corresponding figures for herring were about 103,566,888. Compared with the output for last year there was a decrease of 7 per cent in quantity and 11 per cent in value in products from the fisheries.

Twenty-two thousand five hundred and seventy-seven persons were employed in the commercial fisheries. Of these 12,360 were whites, 4,838 natives, 670 Chinese, 997 Japanese, 2,742 Filipinos, 885 Mexicans, 32 Negroes, and 53 unclassified. In 1930 the total figure was 27,568 or about 5,000 more than in 1931.

Forty-nine thousand five hundred and twenty-four fur-seal skins were taken from the Pribilof Islands in 1931, the largest number taken in any year since 1889. The number of seals in the herds, August 10, 1931, is estimated to be 1,127,028, an increase of 7.84 per cent during the past year.

Three public auction sales of fur-seal skins from the Pribilof Islands were held during the fiscal year 1932 and 305 sealskins were disposed of at special sales authorized by the Department of Commerce. In all 32,181 sealskins were sold for \$546,219.20.

Recovery of by-products from the carcasses of seals is an important phase of the industry. Oil and meal are manufactured in large quantities. The Pribilof Islands are suitable for the propagation of foxes and these animals are fed with the meal. The revenues from the islands are augmented by returns derived from the sale of white and blue fox pelts that are taken each year. In 1930-31, 889 blue and 26 white fox skins were sold for \$21,025.50. In the season of 1931-32, 1,426 skins were taken, and these will be sold during the coming year.

Since 1918 approximately \$6,000,000 have been deposited in the Treasury of the United States as net revenue derived from the sale of sealskins and fox skins.

For the first time in many years the Yukon River was opened to commercial fishing. The allowable catch was fixed and by this means the fishing operations were confined to local residents. This permitted the natives and others to pack a limited number of fish and thus provide themselves with the necessities of life. Early reports indicate that the open season did not have an ill effect on the fishing in the upper reaches of the Yukon. During the past few years the residents along the lower Yukon have been in destitute circumstances because of the shortage of fur and the closing of the fisheries. The open season should be continued.

The total gold output from all sources is estimated to be 459,900 fine ounces, valued at \$9,507,000, as compared with 410,020 ounces valued at \$8,476,000 last year, and of this amount 51 per cent was derived from auriferous gravels. The lode mines in the Territory yielded \$4,665,000 in gold, and approximately 83 per cent of this sum came from the mines in southeastern Alaska. The Alaska-Juneau mine, situated near Juneau, is the largest mine in the Territory. The perfection of a method for successfully mining and milling the low-grade gold ore on this property is recognized as one of the remarkable achievements in modern mining.

Placer gold recovered in 1931 was valued at \$4,842,000 and as in previous years the principal source was the Yukon-Tanana region, followed by the Seward Peninsula area. More than 77 per cent of the gold produced was mined by dredges. During the year 27 dredges mined approximately 10,214,000 cubic yards of gravel with an average yield of 36.7 cents per cubic yard.

Copper minerals are widely distributed but only one section is mined for the copper contents. The prevailing low price of copper has resulted in a curtailment of production. Eighty-eight thousand

tons of ore produced approximately 22,614,000 pounds of copper, valued at \$1,877,000, as compared with 32,651,000 pounds, valued at \$4,244,600 in 1930.

Silver is recovered as a by-product in the smelting of other ores, principally copper. Three hundred and fifty-two thousand ounces of silver, valued at \$102,000, were recovered from all sources in 1931.

Three million three hundred and twenty-one thousand pounds of lead were recovered in that year. Stream tin or cassiterite has been found in placer deposits in many places. In 1931 tin minerals were recovered from gravels in the Port Clarence district north of Nome. About 5.6 tons of cassiterite, which contained about 73 per cent of metallic tin, were mined. Coal production declined approximately 11.8 per cent in 1931. One hundred and five thousand nine hundred tons, valued at \$556,000 were produced by three mines situated adjacent to the Alaska Railroad. The mines in the Territory supplied only 68 per cent of the total consumption during the year although they are equipped to produce the entire tonnage necessary for local markets.

Petroleum production was confined to the wells of the Chilkat Oil Co. near Katalla in the Bering River field. A few shallow wells supply limited quantities of paraffin-base oil. Gasoline and other products are prepared in a refinery near the wells and shipped to Cordova where a ready market is found. The total output is but a small fraction of the petroleum products that are consumed in Alaska.

Deposits of antimony, arsenic, bismuth, chromium, iron, manganese, mercury, molybdenum, nickel, tungsten, zinc, asbestos, barite, garnet, gypsum, jade, and sulphur have been reported, but the extent of the deposits never has been determined. Limestone and marble are exported from southeastern Alaska. Limestone is exported from Dall Island to Seattle for the manufacture of cement, and the Vermont Marble Co. has large quarries on Prince of Wales Island. Although the various minerals mentioned above yielded only small returns, their diversity, wide distribution, and the interest that has been aroused in the search for them indicate that they may be an important factor in the future mineral output of the Territory.

The outlook for the mining industry for next year is most encouraging. Reports from all districts indicate that there are more prospectors in the field than there have been for many years.

The United States Bureau of Mines functions in the Territory under supervision of the Supervising Mining Engineer for the Geological Survey. The coal-mining industry is confined to the region adjacent to the Alaska Railroad and the Bureau of Mines maintains a fully equipped mine rescue car to meet emergencies which may arise. In addition to the mine rescue car a competent instructor from the Bureau of Mines is engaged in educational work pertaining

to mine-safety service and first-aid methods. His assignment requires him to travel through the Territory and give instruction to miners and others who may be interested in approved mine-rescue and first-aid methods.

Alaska contains two national forests, the Tongass and Chugach, with a combined area of 21,344,283 acres. The Tongass Forest embraces practically all of southeastern Alaska east of the one hundred and forty-first meridian and the Chugach entirely surrounds Prince William Sound. It is estimated that these reserves contain approximately 84,760,000,000 feet b. m. of commercial timber. Western hemlock is the climax forest and comprises about 73 per cent of the total stand. Sitka spruce predominates in some small areas and accounts for about 20 per cent of the available timber. Western cedar and Alaska cedar comprise about 6 per cent. The forest service of the Department of Agriculture estimates that the forest can maintain an annual production of 1,000,000,000 feet b. m. in perpetuity under scientific management.

Careful estimates by competent engineers show that approximately 90 per cent of the available timber is suitable for the manufacture of paper.

Within the forested areas there are power sites capable, when fully developed, of supplying approximately 500,000 horsepower. The available power in each site varies between 250 and 32,000. In some districts 75,000 horsepower may be concentrated in one place by linking several sites. The probable cost of development varies between \$65 and \$125 per horsepower. Information relating to each site is available.

The annual production of timber from the national forests suffered a sharp decline during the calendar year 1931. Two factors, low prices of imported lumber and a decline in local demands, account for the reduced output. The total production was 24,000,000 feet b. m., valued at \$41,000.

Alaska contains but one national park, created in 1917, and named for its most imposing topographic feature, Mount McKinley, 20,300 feet in elevation. The park was conceived principally as a sanctuary for wild life characteristic of the region, mountain sheep and caribou. As originally established it contained 1,693,800 acres, but after several years of investigation it was apparent that adjacent areas should be included and during the past year 246,693 acres were added. The total area is 1,939,493, and it is exceeded in size by only one other national park, Yellowstone.

The outstanding achievement this year was the successful ascent of Mount McKinley by a party headed by the park superintendent. Another party engaged in an attempt to establish a station for

scientific observations met with disaster, and two of the members lost their lives.

Perhaps no other national park affords the visitor an equal opportunity for observing and studying wild life. Moose, bear, foxes, wolves, coyotes, sheep, and caribou may be seen from easily accessible points. The Alaska Railroad provides transportation from Seward to the entrance on the eastern boundary, and for many years to come this will be the only feasible route into the park.

A road suitable for automobiles has been constructed from the railroad station to a point near the western boundary.

The report of the general manager of the Alaska Railroad shows an increase of 0.20 per cent in passenger revenue and 31.62 per cent increase in freight revenue during the year. The total deficit for rail and river-boat operations was \$412,466.75, or a decrease of 30.06 per cent. The total rail and water line revenues, including non-operating income, was \$1,337,450.63, an increase of 16.54 per cent, and the operating ratio for the railroad was 132.09, as compared with 154.31 for 1931. Steamboat transportation on the Yukon and Tanana Rivers was maintained to serve regions tributary to the railroad. A new river steamboat is under construction, which will replace the two boats now in operation and reduce the cost of this service.

The geologists and engineers continued their investigation in many areas tributary to the railroad. This work was inaugurated last year under authority of Congress. Contracts were awarded for drilling 8 test holes, 4 approximately 2,000 feet in depth in the anthracite ridge field and 4 not to exceed 1,000 feet in depth in the vicinity of Moose Creek. The results of this drilling are not known at this time.

Efforts on the part of the railroad to colonize lands adjacent and tributary thereto resulted in the settlement of many new homesteads in the Matanuska Valley and other agricultural districts. Passenger tariffs were increased approximately 66 per cent and freight rates were raised to produce approximately 50 per cent increase in revenues based on the tonnage transported in 1930. The present rates discourage attempts to develop low-grade lode and placer deposits.

Transportation companies serving Alaska offered their usual facilities and throughout the season the passenger boats made scheduled trips. However, the number of passengers carried was approximately 20 per cent less than for the previous year. This can be accounted for by the general unfavorable conditions. Alaska offers unique and incomparable attractions to travelers and with the return of normal conditions travel will increase. The sheltered passages adjacent to the southeast coast of the Territory offer unexcelled opportunities for yachting. Each year many such craft ply these waters during the summer months.

The wild game in Alaska is one of its greatest assets, and with wise conservation the future supply will be assured. There are districts now almost devoid of wild life which are capable of sustaining a variety of game and fur-bearing animals. The Territorial government, in cooperation with the Alaska Game Commission, has undertaken to meet the situation by stocking suitable areas with elk, buffalo, sheep, muskrat, and beaver. Favorable reports have been received from most of these projects. The value of land fur-bearing animals, and furs, exclusive of seals, shipped from Alaska in 1931 was \$1,770,-324.02 as compared with \$2,141,289.74 in 1930. The sharp decline is accounted for by the low prices received for fur.

Schools are maintained in 16 incorporated towns and 1 incorporated school district, with 168 teachers, a high-school enrollment of 908, and an elementary-school enrollment of 2,754. Teachers' salaries aggregated \$294,632.33 and other expenditures \$105,394.98. The cost per pupil in average daily attendance for the school year 1931-32 was \$125.28. Sixty-three rural schools were maintained in districts outside of incorporated towns and districts, and in addition nine special schools were maintained during the year. The cost per pupil in average daily attendance in the rural schools was \$141.92 for the year. The cost per pupil in average daily attendance in the special schools for the year was \$235.08. Outside of incorporated towns the salaries of teachers aggregated \$137,222.80 and other expenses \$54,896.30, or a total of \$192,119.10. The total enrollment was 1,669, and the average daily attendance was 1,353.4.

The United States Public Health Service maintains nine relief stations in Alaska, affording medical relief to merchant seamen and other beneficiaries. In addition to the service rendered at these stations, and the excellent work performed for the natives and others at outlying places by the doctors on the revenue cutters, very valuable assistance is given in cooperation with Territorial health authorities in the examination and vaccination of nonresidents employed in the fisheries. Each year all those who embark from outside ports for Alaska to engage in work in the canneries are examined by the United States Public Health Service. Those who are incapacitated or afflicted with communicable diseases are rejected. This work has extended over a period of years, and a marked improvement in general health conditions is apparent.

The legally adjudged insane from the Territory are cared for in Morningside Hospital, Portland, Oreg., under contract. This system has been in operation for more than 28 years. Many attempts have been made to have the contract system abolished and to have the patients cared for in a Government institution. The desirability of such a change is apparent and it is hoped that some arrangements may be made before the expiration of the present contract. During

the past year 64 patients were admitted and 48 were discharged or otherwise removed. On June 30, 1932, there were 273 in the institution, an increase of 16 during the year.

Reindeer were introduced into Alaska about 40 years ago as a relief measure to provide food and clothing for the native people. The original herds contained less than 1,500 animals. From this small herd the western part of the Territory has been supplied and it is estimated that there are several hundred thousand animals in the herds that are distributed from Point Barrow to Atka Island and in the Yukon and Kuskokwim Valleys.

The reindeer service was organized and an advisory council consisting of six members was created by the Secretary of the Interior. The council recommended new range rules and submitted a plan for an organization to manage the industry. The range rules were submitted to all reindeer owners and with but one or two exceptions the owners have approved them and agreed to abide by them. Necessary changes may be made from time to time as conditions may warrant. Under the plan of organization, suggested by the council, the Territory that is occupied by reindeer herds is divided into administrative units of a size that can be efficiently supervised by a field manager.

Aviation has emerged from the experimental stage and takes its place amongst the recognized transportation facilities in the Territory. The Territorial government recognizes the importance of rapid transportation in the development of the more remote sections of the Territory and adopted a comprehensive program for the construction of landing fields and hydroplane ports. The residents of many communities have contributed generously to these projects and at present there are 68 landing fields in strategic places in the Territory. There are now 31 planes in the Territory and incomplete data show that 6,637 passengers were carried for a total of 942,176 passenger miles without loss of life or cargo; 496,680 pounds of freight, express, and mail were transported.

The governor makes the following recommendations:

1. Relief of local unemployment by construction of rivers and harbors projects that have been recommended to Congress and the completion or repair of existing projects. Items for the improvement of Dry Pass, Sitka Harbor, Stikine River, Kodiak Harbor, and for further improvement of Wrangell Narrows, Wrangell Harbor, and Nome Harbor have been recommended to Congress. The Ketchikan Harbor improvement is not completed and repairs are necessary to the Lowell Creek project at Seward. Construction work on these projects could employ many men and be of inestimable benefit to the Territory.

2. In addition to the above projects, reports have been submitted for the improvement of Petersburg Harbor, Craig Harbor, Gastineau Channel, and Salmon River at Hyder. The early consideration of these reports is urged.

3. The national forests in Alaska contain the most densely populated sections of the Territory and within these areas the unemployment situation is most acute. There are within these forests many road projects that have been recommended by local authorities. Construction work should be undertaken on these projects this season. All of the proposed projects referred to above can be completed with the funds that will be available if Alaska is given its share of the appropriations as apportioned in the act of November 9, 1921.

4. The completion of the road through McKinley National Park will permit easy access from the Alaska Railroad to the Kantishna mining district, thus encouraging development of a well mineralized area and possibly developing tonnage for the railroad.

5. Glacier Bay National Monument embraces some of the most attractive features in southeastern Alaska. It is easily accessible and, if the boundaries are changed so as to include adjacent areas, it will afford a sanctuary for wild life that can not be surpassed. The present national monument and adjacent areas should be included in a national park.

6. Schools and hospitals are needed in many sections of the Territory to care for the native people. A 10-year construction program has been recommended. This plan would assure a definite number of buildings each year. Under the present plan it is often impossible to erect the buildings until the years following the appropriation.

7. The hospital boat of the Yukon River serves a large territory and gives medical aid to residents in isolated places. The present boat is old and should be replaced with a new vessel completely equipped for the service.

In addition to the above it is desired to invite consideration to the recommendations that have been made in previous reports: A Coast Guard cutter in western Alaska during the winter season; a stabilized road-building program that will assure the Alaska Road Commission definite appropriations for a period of 10 years; Federal buildings in Anchorage and Ketchikan; consolidation of law enforcement agencies in one organization; and, increased allotments for relief of destitution among the native people.

THE TERRITORY OF HAWAII

SUMMARY OF THE GOVERNOR'S REPORT

The Governor of the Territory of Hawaii, Hon. Lawrence M. Judd, in his annual report states that the Territory's balance of trade was favorable, the value of exports amounting to \$102,737,835 and imports \$86,956,768; that of the exports approximately \$97,000,000 was for sugar and pineapples, the two principal crops of the Territory.

Hawaii enjoyed the healthiest year in its history, the death rate being 9.76 per 1,000 population against 10.20 in 1931, the previous low record. While epidemics of measles and influenza prevailed during the year, they were of a mild type.

The year, especially during the last six months, is reported to have been an eventful one for Hawaii. The Territory, the governor states, came in for a great deal of unfavorable publicity, due to widespread publication by certain factions of the mainland press of exaggerated and untrue reports of conditions there. The governor further states that—

Realizing the necessity of enacting certain changes in our statutes relating to law enforcement, I called the legislature into special session on January 18, 1932. Their work remaining unfinished at the legal date of adjournment, March 28, I called a second special session on March 29. This session concluded its work on June 3. * * *

Although everyone who knows the islands and conditions here realizes the amazing absence of any crime problem of major proportions, as previously found by the governor's advisory committee on crime, and more recently by the Hon. Seth W. Richardson, Assistant Attorney General of the United States, upon completion of his investigation of conditions in the Territory, Hawaii has nevertheless been made the victim of an unfortunate occurrence last September, despite the admitted fact that said occurrence was practically an isolated case of its kind in our midst, in no wise reflecting the peaceful and law-abiding nature and conduct of our citizens. Even after Mr. Richardson's favorable report on crime conditions in the Territory, a portion of the American press and certain other agencies, intent upon furthering their own peculiar purposes, have persisted in their attempts to fan the flame of ignorance and hatred for their own ulterior purposes, but fortunately the facts belie these attacks and a remarkable change in mainland attitude toward the islands is most apparent.

More particularly Honolulu, and generally the Territory as a whole, has been the beneficiary of numerous legislative enactments effecting a complete change in the Honolulu Police Department, the management and control of prisoners, selection of trial jurors, prosecution of criminal cases, and various other phases of governmental affairs. The morale and efficiency of the Honolulu Police Department, under the new appointive, rather than elective, chief, and under the guidance of the newly appointed police commission, is nothing short of amazing when

compared to its functioning under the old system. This has all been made possible by the enactment of Act 1 of the first special session of the legislature of 1932.

Under Act 17 of the same session the control of prisoners at Oahu Prison has for the first time been placed upon a really workable basis, with the empowering of the board of prison directors to appoint, hold responsible, and remove a warden from the prison. The results of this much-needed legislation are gratifying in the extreme.

Under Act 18 of the first special session, 1932, a complete revision of our selection of trial jurors will be in effect for the calendar year 1933 and thereafter. The list for the first judicial circuit has been reduced from 1,000 to 650, with no requirement as to equal precinct representation, higher qualifications, and more restricted exemptions. The jury commissioners are also now empowered to summon prospective jurors for preliminary personal examinations.

Although the Richardson report was most complimentary on the quality of our present jury list and the results of our jury system in the past, as compared to mainland communities, we should in the future have jury lists generally far superior to those in any other part of the United States.

Whereas Honolulu has been specifically found by Mr. Richardson to compare very favorably with communities of similar size on the mainland, it should now be possible, with the splendid machinery provided by the recent special sessions of the legislature, to make Honolulu not merely favorably comparable to other communities, but in fact an exemplary community.

The production of sugar for the period ended September 30, 1931, was 993,787 short tons harvested from approximately 138,000 acres. The total number of acres planted in cane in 1931 approximated 252,000 acres.

This industry continues to be the dominant industrial one in the territory, both in the number of people employed directly on the plantations and the number of citizens dependent upon the industry for their livelihood. Approximately 105,000 men, women, and children live on sugar plantations either as employees or members of their families. Practically half the population of the territory, other than the residents of the cities of Honolulu and Hilo, live on sugar plantations. In addition, other industries more or less dependent on sugar planting provide employment for many thousands more of the people.

The price of sugar during the past year reached the lowest figure ever known. While struggling under losses due to low selling prices, the sugar industry has been able, because of its wise and conservative management, to carry on with a minimum of hardship on its employees. The numbers employed have not diminished as compared with other years and higher rates continued to be paid than those to any other sugar workers in the world, including the mainland of the United States.

The year was an unfortunate one for the pineapple industry. All companies lost money, and the recent restrictions in operations contributed materially to the unemployment existing in the territory. Many thousands of tons of pineapples have been left in the fields and the planting of new areas has been restricted. This unfortunate

condition has decreased the taxable assets of the territory and thrown many people out of employment.

The past year has seen the inauguration of a new industry—the manufacture of insulating board from sugarcane bagasse—which promises to assume great proportions. At the end of May and June commercial production was well under way. Six million square feet of board had been manufactured, 4,000,000 square feet of which had been shipped to the mainland and a very substantial amount had gone into the hands of the building trade of the territory. A termite-proof board suitable for distribution in the Orient will be manufactured in anticipation of considerable exports thereto.

From every standpoint the year in the Hawaii National Park has been a successful one. Volcanic activity was renewed during the Christmas holiday season, enabling thousands of visitors to view this wonderful and inspiring spectacle. All travel records to the park were broken, with a total of 124,932 visitors as against 89,578 during the previous year.

Considering the falling off in travel, Hawaii tourist business held up very well for 1931, the total of 15,780 local tourist arrivals being only 15 per cent less than the previous year. The assistant secretary of the bureau handling tourist travel was placed in charge of the Hawaii exhibit at the French Colonial Exposition in Paris, and assembled and took charge of the territory's exhibit, which proved to be a most popular feature of the exposition. It was visited by nearly 2,000,000 people, who crowded the Hawaii Building so heavily at times that the doors had to be closed. In conjunction with this exhibit the tourist bureau printed 25,000 inexpensive folders in French and English, for distribution.

The population of the territory on June 30, 1932, as estimated by the Bureau of Sanitation and Health, was 380,507. The population according to the census of 1930, was 368,336 as against 255,912 for 1920.

Based upon the 1930 census of the United States, the distribution of the population on June 30, 1932, by race, was estimated by the board of health to be as follows:

Estimated population, Territory of Hawaii, by racial descent, June 30, 1932

Hawaiian.....	22, 230	Chinese.....	27, 235
Caucasian-Hawaiian.....	17, 056	Japanese.....	146, 189
Asiatic-Hawaiian.....	14, 459	Korean.....	6, 653
Portuguese.....	28, 595	Filipino.....	65, 515
Puerto Rican.....	7, 000	All others.....	805
Spanish.....	1, 253		
Other Caucasian.....	43, 517	Total.....	380, 507

During the year satisfactory progress is shown to have been made in the improvement of the public-school service. Enrollment has

increased from 76,530 to 78,663, while the teaching staff has grown from 2,656 to 2,686. The rate of increase in student enrollment has been less rapid than for any year during the last decade.

Part-time and evening classes have been conducted for women covering all phases of home-making, particularly meal preparation, clothing, home decoration, child care, and weaving.

Considerable attention has been given to a vocational agricultural program, and instruction is also now being offered to both boys and girls in carpentry, machine shop, auto mechanics, electricity, dress-making, and weaving; also in typing and shorthand work.

The total number of public schools in the territory was 181, with an attendance of 78,663 pupils and 2,686 teachers. The number of private schools was 74, having an attendance of 12,617 with 598 teachers, making the total number of pupils in attendance on June 30, 1932, 91,280.

The following is a comparative table of racial descent of pupils attending all public schools in the territory June 30, 1932:

Racial descent	Number of public-school pupils	Per cent of total	Racial descent	Number of public-school pupils	Per cent of total
Hawaiian.....	3,006	3.82	Japanese.....	42,864	54.49
Part Hawaiian.....	8,245	10.48	Korean.....	1,934	2.46
Portuguese.....	5,737	7.29	Filipino.....	4,156	5.29
Puerto Rican.....	1,298	1.65	All others.....	1,009	1.28
Spanish.....	299	.38			
Other Caucasian.....	3,352	4.30	Total.....	78,663	100.00
Chinese.....	6,733	8.56			

Classification of public-school pupils by birthplace and sex, June 30, 1932

	Hawaii	Maui	Oahu	Kauai	Total
Born in the United States.....	16,345	11,654	42,067	7,358	77,424
Foreign born.....	164	245	656	174	1,239
Total.....	16,509	11,899	42,723	7,532	78,663

	Male	Female	Total	Percent-age of total
Born in the United States.....	40,240	37,184	77,424	98.4
Foreign born.....	704	535	1,239	1.6
Total.....	40,944	37,719	78,663	100.0

The income of the various counties comprising the territory aggregated \$11,511,852.28 as against \$11,713,979.30 for the prior year. The assessment of real and personal property in the territory, as rendered by the tax assessors for 1932, aggregated \$328,685,005 as against \$390,556,301 for 1931. The total revenues collected by the

territory aggregated \$12,208,679.90 and the total expenditures were \$12,422,947.14.

Local governments in Hawaii were first established on July 1, 1905, the territory being divided into four counties. On July 1, 1909, the county comprising the island of Oahu was converted into a city and county, known as the city and county of Honolulu, with a mayor.

The other counties are Hawaii, including the island of that name; Maui, including the islands of Maui, Kahoolawe, Lanai, and all of Molokai except the leper settlement; and Kauai, including the islands of Kauai and Niihau. The leper settlement on Molokai constitutes a fifth count, Kalawao, which is under the control of the board of leper hospitals and settlement.

The total bonded debt on June 30, 1931, was \$32,000,000, which was increased by \$405,000 March 1, 1932, issue of 4¼ per cent public improvement bonds. The details are set forth in the following table:

Date of issue	Term of years	Rate of interest	Sale price	Percentage basis	Aggregate outstanding	Date due	Where payable, principal and interest
Aug. 1, 1911.....	20-30	<i>Per cent</i> 4	\$101.5875	3.88	\$1,500,000	Aug. 1, 1941	New York and Honolulu.
Sept. 3, 1912.....	20-30	4	100.5887	3.985	1,500,000	Sept. 3, 1942	Do.
Sept. 15, 1914.....	20-30	4	100.01	4.00	1,430,000	Sept. 15, 1944	Do.
May 15, 1916.....	20-30	4	100.00	4.00	1,750,000	May 15, 1946	Do.
Aug. 1, 1917.....	20-30	4	98.04	4.08	1,500,000	Aug. 1, 1947	Do.
Sept. 15, 1919.....	20-30	4½	102.814	4.377	1,500,000	Sept. 15, 1949	Do.
Sept. 15, 1920.....	20-30	4½	98.01	4.59	2,400,000	Sept. 15, 1950	Do.
Dec. 15, 1920.....	20-30	4½	98.01	4.59	200,000	Dec. 15, 1950	Do.
Dec. 31, 1920.....	20-30	4½	98.01	4.59	600,000	Dec. 31, 1950	Do.
June 1, 1922.....	20-30	4½	103.365	4.25	1,350,000	June 1, 1952	Do.
Oct. 1, 1923.....	20-30	4½	99.577	4.52	1,800,000	Oct. 1, 1953	Do.
Do.....	20-30	4½	99.577	4.52	75,000	do.....	Do.
Apr. 1, 1924.....	20-30	4½	99.078	4.56	2,285,000	Apr. 1, 1954	Do.
Oct. 1, 1925.....	20-30	4½	101.042	4.39	2,590,000	Oct. 1, 1955	Do.
May 1, 1926.....	20-30	4½	105.125	4.27	1,540,000	May 1, 1956	Do.
Oct. 15, 1926.....	20 30	4½	103.196	4.26	1,805,000	Oct. 15, 1956	Do.
Jan. 15, 1927.....	20-30	4½	104.82	4.18	385,000	Jan. 15, 1957	Do.
Nov. 15, 1927.....	20-30	4½	107.22	3.98	50,000	Nov. 15, 1957	Do.
Do.....	Serial.	4½	106.06	3.98	2,750,000	1932-1956	Do.
May 15, 1928.....	Serial.	4¼	102.37	4.07	1,575,000	1933-1957	Do.
Feb. 1, 1929.....	Serial.	4¼	100.093	4.24	1,175,000	1934-1958	Do.
Nov. 15, 1929.....	Serial.	4¾	101.529	4.62	1,945,000	1934-1958	Do.
June 30, 1931.....	Serial.	4¼	102.819	3.99	295,000	1936-1960	Do.
Mar. 1, 1932.....	Serial.	4¾	100.00	4.00	405,000	1936-1960	Do.

Total, \$32,405,000.

Bank deposits at the end of the year amounted to \$73,684,161.52, of which \$38,653,331.79 were commercial deposits and the remainder, \$35,030,829.73, were savings deposits. The savings accounts by races were as follows: Japanese, 59,915; Chinese, 17,252; Hawaiian, 17,682; Portuguese, 12,573; Filipino, 21,307; all others, 42,219; total, 170,948.

During the year 88 corporations were created and 48 were dissolved, as follows:

	Created	Dissolved		Created	Dissolved
Mercantile.....	70	41	Railway.....		
Agriculture.....	2	1	Trust.....	1	2
Eleemosynary.....	11				
Investment.....	4	3	Total.....	88	48
Air transportation.....		1			

Leaving at the close of the fiscal year 1,273 domestic corporations, an increase of 40.

The total capitalization of domestic corporations, other than eleemosynary, etc., is \$344,998,258, a decrease of \$2,234,205, or .64 per cent for the year.

The fire insurance premiums during the calendar year 1931 amounted to \$1,285,766.61 and the fire losses paid aggregated \$116,405.10.

The marine insurance premiums amounted to \$354,512.27 and the losses amounted to \$75,271.98.

Life insurance was valued at \$19,436,201 and the premiums paid thereon aggregated \$688,887.40. The renewal on premiums was \$4,331,074.21 and the losses paid amounted to \$2,077,456.57.

The public lands of the Territory of Hawaii have an estimated total area of 1,589,175 acres. These lands, with the exception of areas set aside for special public purposes, are administered by the commissioner of public lands and are homesteaded, sold, leased, or exchanged in accordance with the provisions of section 73 of the Hawaiian Organic Act, as amended. Ninety-one land patent grants were issued, covering a total area of 740.051 acres valued at \$48,415.04, 22 of which are on homesteads covering a total area of 687.84 acres valued at \$17,478.15.

In the Pacific coast-Hawaii trade the Matson Navigation Co. during the past year operated the following services: From San Francisco and Los Angeles, weekly passenger and freight service; from San Francisco, weekly freight service; from Portland, freight service every six weeks; from Puget Sound, freight service every three weeks; periodical lumber service from Columbia River and Puget Sound ports. Included in the above are the steamers of the Oceanic Steamship Co. (of which Matson Navigation Co. are owners), which make Honolulu a port of call in their service to and from Australia and New Zealand.

Honolulu is a regular port of call for steamers of the Dollar Steamship Lines in their trans-Pacific service from New York to the Orient, operating seven steamers, and their "round the world" service, operating eight steamers. Five steamers of the Nippon Yusen Kaisha in their trans-Pacific service and four in their South American-Japan

service make Honolulu a regular port of call. The Canadian Australasian Line (Ltd.) have two vessels making Honolulu a regular port of call, and the Canadian Pacific Steamships (Ltd.) four steamers in their trans-Pacific trade.

In addition, the Isthmian Line offered regular freight service between Atlantic-coast ports and Honolulu, and numerous other freighters have put in at Honolulu for supplies or cargo offerings.

Oil tankers were operated between Pacific-coast and Hawaiian ports by the Associated Oil Co., the Standard Oil Co. of California, and the Union Oil Co. of California. The cargoes received by these companies during the fiscal year, including shipments received on commercial liners, were: Associated Oil Co., 726,764 barrels of fuel oil, gasoline, kerosene, grease, and lubricating oil combined; Union Oil Co., 628,112 barrels of fuel oil, 49,120 barrels Diesel, 3,886,235 gallons of gasoline, and 242,286 gallons of kerosene; Standard Oil Co. of California, 1,461,131 barrels of gasoline, distillate, kerosene, lubricating oils, greases, and fuel oils combined; Shell Oil Co., 650,000 barrels of gasoline, kerosene, fuel oil, Diesel fuel oil, and lubricating oil combined.

There are steam railroads on the four principal lines having a track mileage of 360.99 operating on a regular schedule and most of them carrying passengers. In addition, plantations have their private railway equipment for transporting cane and laborers.

The Honolulu Rapid Transit & Land Co. controls and operates the only street-railway system in the Territory. It is an electric line, partly single and partly double, and has an authorized capital stock of \$3,000,000 of which \$2,500,000 is outstanding. The privately owned motor-driven vehicles in the Territory aggregate 48,841, of which 32,529 are in the city and county of Honolulu, the remainder being divided among the three counties of Hawaii, Maui, and Kauai.

The development of the Territorial airports has been the principal work of the aeronautical commission during the past year. The airports on all of the principal islands are now in fine shape. During the year there were carried 8,426 passengers, a decrease of 3,780 over 1931. The number of miles flown was 264,460, and hours flown 2,721.

Studies and investigations concerning the status of leprosy in Hawaii were made in 1930 by an advisory committee. Surveys were made, and plans were offered for a reorganization of leprosy affairs under the Territorial government. The results were legislative enactments making provision for new administrative procedure by the establishment of a board of leper hospitals and settlement as a policy-making agency and a general superintendent as the administrative official.

The incidence rate of leprosy in Hawaii for the past seven years has been progressively downward. Findings seem definitely to justify

that the incidence of leprosy has been and is decreasing among the native Hawaiian population. Whereas they constituted 95 per cent of admissions to the hospital 40 years ago, other racial groups are now furnishing 40 per cent of the admissions. Patients in the Kalihi Hospital at the end of the fiscal year were 162; male 98, female 64. Patients in the leprosarium at Kalaupapa were 430; 279 male and 151 female.

Under the Territorial retirement system the active-service register on June 30, 1932, recorded a total registry since the commencement of the system of 7,397. During the year there was an increase in membership of 271. The following statement illustrates the growth of the system in membership, pensioners, assets, receipts, and disbursements:

Year ended June 30—	Member- ship	Pension- ers	Assets	Receipts	Disbursements	Adminis- tration expenses
1926.....	2,028	84	\$124,699.81	\$174,876.78	\$147,527.43	\$16,780.71
1927.....	2,682	101	481,502.31	522,282.81	505,688.96	14,921.83
1928.....	3,385	115	1,069,831.03	760,769.81	733,644.78	21,567.65
1929.....	3,963	132	1,831,378.16	1,014,049.12	879,964.79	22,907.78
1930.....	4,524	174	2,666,239.08	1,214,433.05	966,591.05	22,587.22
1931.....	4,778	184	3,667,752.17	1,789,152.71	1,422,769.05	21,365.49
1932.....	5,049	227	4,606,069.19	1,882,212.71	1,439,937.53	22,968.43

THE VIRGIN ISLANDS OF THE UNITED STATES

SUMMARY OF THE GOVERNOR'S REPORT

The Governor of the Virgin Islands, Hon. Paul M. Pearson, in his report for the fiscal year ended June 30, 1932, indicates that considerable progress has been made in carrying out the various rehabilitation projects and in securing needed legislation affecting the Virgin Islands from Congress.

Geographical location.

1. The group of islands called the Virgin Islands of the United States comprises the islands of St. Thomas, St. John, and St. Croix, with about 50 islets, mostly unnamed and uninhabited, lying about 60 miles due east of Puerto Rico. The total area of the islands is about 132 square miles (about one-tenth of that of the State of Rhode Island).

Historical sketch.

2. The Virgin Island group was discovered by Christopher Columbus on his second voyage. He found the island of St. Croix populated by Carib Indians, a race of fierce warriors and courageous travelers. It has never been accurately determined exactly how long after the discovery of these islands the Caribs continued to inhabit them. It is claimed that the Indians were driven away from the Virgin Islands in the reign of Charles I of Spain about the year 1555, the emperor having directed that they be treated as enemies and exterminated.

Danish, English, Dutch, and French settlers came to the Virgin Islands during the seventeenth century, the first recorded settlement being made on the island of St. Croix in 1625, the first recorded settlement on St. Thomas in 1666, and upon St. John in 1684. At the time, these settlements were made there were no Indian inhabitants in the islands.

The islands of St. Thomas, St. John, and St. Croix, comprising the Danish West Indies, were under the control of the Danish West India & Guinea Co. until the year 1754, when the company's shares were sold to King Frederick V of Denmark, and the islands came under the direct control as royal colonies. Several minor slave insurrections took place at various times in St. Croix, under Danish rule. All were quickly quelled until the one which many years later culminated in the complete emancipation of all slaves in the islands.

This was in the year 1848, or 15 years before the emancipation of slaves in the United States.

The Danish West Indies, now known as the Virgin Islands of the United States, were acquired from Denmark in 1917 for \$25,000,000.

Climate and rainfall.

3. The climate of the Virgin Islands is remarkably fine. While the islands are situated within the Tropics, the heat of the tropical sun is tempered by the refreshing trade winds which blow constantly.

The rainfall is not excessive, averaging 47 inches per year. May, August, September, October, and November are usually the rainy months. However, in St. Croix the rainfall varies greatly, making the raising of sugarcane, the principal product of the island, extremely hazardous. Periods of drought running over a number of years are of frequent occurrence and cause untold damage to the sugar crops.

The months of June to November are known as the hurricane season. Devastating hurricanes are not of frequent occurrence, destructive storms having visited the islands in 1713, 1738, 1742, 1772, 1793, 1819, 1837, 1867, 1916, 1924, and 1928.

Population.

4. There are approximately 22,000 people living in the islands, classified into four major groups, as follows:

	Per cent
White.....	9. 1
Negro.....	78. 3
Mixed.....	12. 4
All other.....	. 2

The term "mixed" is used to designate persons of mixed white and negro blood.

Economic conditions.

5. The Cattle Cooperative of St. Croix, organized a year ago, continued to function throughout the year, making weekly shipments of cattle to Puerto Rico.

The Handcraft Cooperative of St. Thomas increased its sales, increased its list of products, and extended its markets in the States. An exhibit was held in the Grand Central Palace in New York City, and a second exhibit in the American Fair at Atlantic City.

The Charcoal Cooperative of St. John renewed its contracts for monthly deliveries for the year and increased its sales.

The Arcola Rug Co. was organized in connection with a manufacturing firm in New York City which takes the entire output of the local factory, where work is promised for some 500 people.

A sugar engineer of New York City was interested to come to the Virgin Islands to investigate the possibilities of reopening the Bethlehem sugar factory and cultivating the Bethlehem sugar estates in

St. Croix, which have been idle for more than two years. Plans for consummating this project are making progress.

A vegetable growers' association has been organized in St. Croix and a sales agreement signed with a New York commission firm for marketing this early crop, which will reach New York three months before Florida vegetables are ready. Some 500 acres of tomatoes and other vegetables are being planted.

Representation was made to the West India Oil Co., which resulted in a reduction of 4 cents in the selling price of gasoline.

A committee consisting of the Secretary of the Treasury, the Secretary of the Interior, and the governor is making progress on the plan for a new bank to replace the National Bank of the Danish West Indies, which is to close at the expiration of its charter, June 20, 1934.

Correspondence and personal interviews with all steamship lines which do a cruise business in the Caribbean.

Many personal interviews and much correspondence with groups and individuals who are interested to visit or to settle in the islands.

The homesteading plan has been pushed through many difficulties and changes, so that before this is in print Virgin Islands homesteaders will probably be on land which they will have agreed to pay for in installments.

Plans have been made finally for a hotel to be built on the unit plan and details of property and building are being worked out.

Much has been done in a preliminary way in developing tourist trade, but until another hotel is ready such work can only be preliminary.

An attractive line of pottery has been designed and made and is now being marketed.

Bay rum is the chief export of St. Thomas. For 20 years bay-rum exports have steadily increased, until the fiscal year 1930-31 showed an output of 138,065 gallons. The fiscal year 1931-32 showed a drop in exports to 69,142 gallons, valued at \$39,802, the lowest, with one exception, since 1918-19.

Weekly shipments of fresh fish are being made to Puerto Rico. These fish, contrary to previous practice, are gutted and gilled when caught, held in cold storage, and shipped (an overnight trip) in ice. They arrive in excellent condition and have found ready sale.

In St. Thomas the chief reliance for employment, directly or indirectly, has always rested upon its harbor, local prosperity varying greatly according to the number of merchant ships which enter to transship cargo or come for coal or oil bunkers. The installation of a dry dock at St. Thomas is now being considered. There is a demand for such service, and such a dock would mean additional employment and additional expenditures in the port of St. Thomas.

During the year the food-garden idea was inaugurated in St. Thomas and two parcels of land were secured at the eastern and western ends of the town.

The canning of fruits and vegetables has been carried on in a small experimental way both in St. Croix and in St. Thomas.

About 70,000 seedlings, grown in the plant shed erected in St. Thomas, were distributed during this past year throughout St. Thomas and St. Croix. It was concluded, however, that the general reforestation of the Virgin Islands is not a practical project, but that it should be continued in an incidental way.

There was inaugurated on the island of St. Croix a program for searching out and destroying of wild cotton and any other host plants that remain to harbor the pink bollworm, the pest that destroyed St. Croix's profitable cotton industry 10 years ago. If and when the results of experimentation and the campaign of eradication justify, the cultivation of cotton will be undertaken again on the island of St. Croix.

Public welfare.

The head of this department made 1,020 visits and conducted 1,192 interviews and investigations. The department administered budgeted relief funds, pensions, and legacies, and found homes for orphans and helped to find parents in the States for deserted children in the islands.

Public health.

No infectious diseases have occurred in epidemic form. In St. Croix malaria imported from an island outside the Virgin group gained a foothold during the year and spread throughout the island. To date there have been some 700 cases. At the present time, however, the spread of this disease has been checked and is well under control.

Though the death rate has been measurably decreased through improved sanitation and hospitalization, further improvement can best be made only through an educational program extending to the home. The following is a comparative table of mortality in continental United States and in the Virgin Islands:

Infant mortality in 1,000 children born:	
United States.....	69
Virgin Islands.....	145
Death rate per 1,000 population:	
United States.....	12
Virgin Islands.....	21

Agricultural station.

At the close of the fiscal year 1932 the agricultural station, which since the transfer in 1917 has been under the direction of the Department of Agriculture, was transferred to the Department of the Interior

and will be under the direction of the governor. The agricultural station will continue with slightly reduced personnel. Throughout the year on which we are now reporting the staff has cooperated in a hearty way with the administration and has shown itself efficient and valuable in the development of the island. The emphasis hereafter is to be on extension work instead of on experimental work, though some experimental work will be conducted.

Department of education.

The enrollment in the public schools during the past year was the greatest in the history of the islands, and it is now clear that there will be an even larger enrollment during the coming year. The average attendance for the year was 97.46 per cent. Ninety-five per cent of all pupils attending schools in the Virgin Islands are protected against smallpox by vaccination. All children have free dental examination and service once a year.

Federal appropriations.

The Federal funds available for 1932 were derived from a direct appropriation of \$643,300 and unobligated balances of previous appropriations amounting to \$79,370, making a total of \$722,670, which is accounted for as follows:

Transferred to Department of Agriculture during fiscal year ending June 30, 1932.....	\$38, 455. 00
Expended by Government of Virgin Islands during fiscal year ending June 30, 1932.....	464, 325. 00
	<hr/>
Balance made available for 1933.....	219, 890. 00
Appropriated for fiscal year 1933.....	412, 000. 00
	<hr/>
Total amount available for expenditure in the Virgin Islands during fiscal year ending June 30, 1933.....	631, 890. 00

ELEEMOSYNARY INSTITUTIONS

ST. ELIZABETHS HOSPITAL

SUMMARY OF THE SUPERINTENDENT'S REPORT

St. Elizabeths Hospital, which is recognized by the American Medical Association as a class A institution, is devoted to the treatment of insane patients of the Army (including civilian employees in the quartermaster pay class), the Navy, the Marine Corps, the Public Health Service, members of the Coast Guard, Veterans' Bureau beneficiaries, and members of the foreign legions or participants in recent wars in the ranks of foreign allies, under reciprocal arrangements; insane residents of the District of Columbia, United States prisoners before and after conviction, inmates of the National Home for Disabled Volunteer Soldiers and of the Soldiers' Home, Washington, D. C., insane American citizens in the Canal Zone whose residence in the United States can not be ascertained, interned persons and prisoners of war under the jurisdiction of the Navy and War Departments, respectively, American citizens who have been legally adjudged insane in the Dominion of Canada, and beneficiaries of the United States Employees' Compensation Commission.

On June 30, 1932, 4,930 patients remained in the hospital as compared with 4,721 on June 30, 1931, an increase of 209.

The total number of patients under treatment during the year was 5,579, as compared with 5,354 for the preceding year, an increase of 225.

The total number of admissions during the year was 858, as compared with 851 for the preceding year, an increase of 7, or about 1 per cent.

The total number of discharges for the year was 401, as compared with 422 for the preceding year, a decrease of 21, or 5 per cent.

The total number of deaths for the year was 248, as compared with 211 for the previous year, an increase of 37, or about 18 per cent.

The total number of discharges and deaths, combined, was 649, compared with 633 for the preceding year, an increase of 16, or a little less than 3 per cent.

The daily average population was 4,798, an increase of 196 over the 4,602 for the preceding year, there having been an average increase of 212 patients for 1931 and 188 for each of the fiscal years 1930 and 1929, or a total of 784 patients since July 1, 1929.

Of the 248 deaths, 42 were buried in the hospital cemetery, 2 were buried in the Arlington National Cemetery, and 204 bodies were turned over to undertakers for burial authorized by the family, or organization.

Movement of patient population, fiscal year 1932

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1931.....	2,560	709	3,269	868	584	1,452	4,721
Admitted during year ending June 30, 1932....	479	154	633	129	96	225	858
Total number under care and treatment during year ended June 30, 1932.....	3,039	863	3,902	997	680	1,677	5,579
Discharged as—							
Not insane.....	16	8	24	1	0	1	25
Recovered.....	45	8	53	10	9	19	72
Improved.....	117	15	132	10	9	19	151
Unimproved.....	106	23	129	17	7	24	153
Total discharged.....	284	54	338	38	25	63	401
Died.....	104	49	153	58	37	95	248
Total number of patients discharged and died.....	388	103	491	96	62	158	649
Number of patients remaining on rolls June 30, 1932.....	2,651	760	3,411	901	618	1,519	4,930

Construction.

The new tuberculosis building for 80 patients was completed and accepted the end of June. Equipment has been purchased, and this building was occupied August 25. The patients in the three tuberculosis buildings will have to be taken care of first, and arrangements made for moving these tuberculosis buildings to a new site, as the new male receiving building will occupy part of the site at present used by these old tuberculosis buildings.

A contract was awarded for two continuous-treatment buildings, kitchen, and dining rooms. This contract was approved December 30, 1931, to be completed within 220 days. Additional contracts were awarded for an elevator and refrigeration plant. Under the contract this work should be completed by August 11, 1932. There has been some delay, however, on the part of the contractor and it is doubtful whether the work will be completed within that time.

An appropriation has been made for a new male receiving building; plans have been prepared and advertisements inserted in journals inviting bids.

In addition to the foregoing the following construction work has been completed during the year: A new turbo generator was installed at the power plant, placed on a concrete foundation which was prepared for that purpose. All auxiliaries were hooked up. A 12-inch pipe was run from the basement, and after this work was completed

a new concrete floor was laid in the basement of the powerhouse. At the pumping plant two motor-driven centrifugal pumps were installed and connected with a 12-inch water main; this 12-inch water main was connected with the District of Columbia water main near the Bolling Field gate. This now furnishes the hospital with complete water service from the District of Columbia. R Building was completely renovated and its bed capacity increased. It has been equipped to care for the chronically physically ill who require hospital care and supervision, special diet and rest, but who do not require as active or as expensive care as in the acute wards of the Medical and Surgical Building. In connection with the continuous-treatment buildings under construction it was necessary to provide service for steam, heat, light, water, etc. The steam and heat had to be carried from the powerhouse, approximately 5,000 feet. A tunnel was built 6 feet 6 inches high and 6 feet wide to contain the steam pipes and other service pipes for this purpose. This tunnel was constructed of reinforced concrete, in the side walls of which were inclosed a system of fiber electric conduits for the wires, with the necessary electric manholes at intervals.

Flood-light illumination has been placed on R Building for the purpose of illuminating the Medical and Surgical Building, and similar lights from West Lodge to Howard Hall. It is believed that this is an improvement on the old street lights and gives more illumination without shadows.

Red Cross.

During the past year the Red Cross, through its hospital unit, sent out 3,889 and received 4,016 letters concerning patients and their affairs. The letters and reports primarily were to secure psychiatric histories and to verify facts furnished by patients or relatives; to make previsit or predischarge investigations; to secure reports of the adjustment of patients on visit outside the District of Columbia; to secure information about and to effect the adjustment of financial problems in the patients' homes which were connected with or incidental to the patients' mental breakdown; to contact the local Red Cross chapters in the towns in which the patients' families live, so that they can take care of any social problems which may exist in the patients' homes; to locate missing relatives of patients; to establish patients' legal residences; to see that the children and wives, resident outside the District of Columbia, may have blood tests when advisable; to have patients' families visited by a social worker with a view to explaining the advantages of having unrecovered patients remain in the hospital when they are requesting discharge. Assistance is given in filing pension claims for patients, and in securing information that may be needed in regard to insurance, Federal bonus, or affidavits; in writing letters for patients; in visiting patients in the wards

and seeing that they are furnished with books, magazines, tobacco, etc. Through the Red Cross unit, theater parties were arranged, as well as attendance at baseball and football games and moving picture shows.

Medical department.

Special effort has been made to improve the classification of the patients. Improvement in this respect has been especially effected among the prisoners in the Howard Hall department, and generally throughout the hospital. The care of the patients on the so-called "back wards" has been greatly improved as a result of the individual attention which has been accorded them. Research work in the laboratory continues in numerous fields.

Recommended legislation.

Attention is again called to the necessity for a complete revision of the lunacy legislation in the District of Columbia. Discussing this matter in detail the superintendent states that—

A bill was introduced in the House of Representatives and in the Senate of the United States last year to change the method of admissions to St. Elizabeths Hospital. The main changes from the existing legislation were:

Provision for voluntary commitment for treatment, on request of patients, with provision for discharge on three days' notice.

Provision that insane persons taken into custody by the police or other officials shall not be subjected to trials as are criminals, but may be held in the hospital and treated and not tried except upon their request or requests of their relatives, guardians, or friends.

If a trial is demanded by an insane person, his guardian, or friends, or by court, upon petition, the insane person shall be heard by the court and not subjected to trial by jury unless the insane person, his relatives, guardian, or friends demand it.

Temporary commitment or detention is provided for, with provision that during such temporary commitment, and prior to formal commitment, the person may be released upon certificate to the District of Columbia by the superintendent of the hospital or by two physicians in regular attendance at any other hospital where the patient may be detained, that the person is not insane or has recovered his or her reason.

Provision for the automatic restoration of the civil rights of patients discharged from the hospital on certificate of the superintendent that they are cured or that further treatment is unnecessary or undesirable.

The proposed legislation recommended, it is believed, would for the most part make unnecessary writs of habeas corpus and would make simpler the release of patients to those competent to care for them.

The proposed legislation would be in keeping with previous attempts to secure legislation amendatory of those portions of the District Code which deal with the admission, detention, and release of patients in the Government Hospital for the Insane (St. Elizabeths Hospital).

In the report of the Comptroller General of the United States (H. Doc. 605, 69th Cong. 2d sess.) suggestion is made that additional legislation on this subject is desirable.

A committee of medical advisers which made a survey of the situation under the direction of the Secretary of the Interior made a number of recommendations for remedial legislation, but did not undertake to draft a measure for this purpose.

The design of the bill suggested was to provide a method more in keeping with the modern humanitarian and medical attitude toward this class of patients, and along lines which have proved effective in several of the States and in other countries.

Provision for emergency commitment is included.

Authority is given the superintendent to consider paroling of patients as a therapeutic measure, and to permit the return of patients to their homes under the supervision of the hospital.

There was a hearing before a subcommittee of the District of Columbia Committee of the House of Representatives during the past year. There were present at this hearing representatives of the hospital and a representative of the corporation counsel of the District of Columbia in favor of the bill, and two parties, a man and a woman, opposed to it.

As a result of this hearing we are more than ever of the opinion that the laws pertaining to the admission and treatment of the patients at St. Elizabeths Hospital should be revised, but we believe that the initiative should be taken by representatives of the District government, and the Interior Department, through representatives of the hospital, should cooperate with the District authorities in securing the enactment of the proposed bill into a law. The District is primarily interested in such legislation as it affects the welfare of its residents, and we believe if the initiative is taken by them it would result in heartier cooperation and have a tendency to receive better consideration.

FREEDMEN'S HOSPITAL

SUMMARY OF THE SURGEON IN CHIEF'S REPORT

Freedmen's Hospital was established under the War Department by the act of March 3, 1871 (16 Stat. 506), and subsequently transferred to the Interior Department by the act of June 23, 1874 (18 Stat. 223). Prior to 1871 the hospital was under control of the War Department as an adjunct of the Freedmen's Bureau, which was established principally for the care of the refugees who came to Washington in large numbers following the close of the Civil War.

The hospital was operated to its full capacity throughout the year. Never before have its facilities undergone so great a strain as during the year just closed. The number of patients admitted exceeded any previous year, and the number of applicants seeking hospitalization, who could not be accommodated because the number of requests exceeded the bed capacity of the hospital, was also greater than any previous year. The widespread employment slump may account for this situation to some considerable extent, but the normal increase in the population of the city and the addition of the new obstetrical wing to the hospital increasing the number of beds from 276 to 316, should be considered important contributing factors.

The operation of the Saturday half-holiday has added to the difficulty of administration. In fact, with the present force of employees, it has been found impossible to comply literally with the terms of the law, inasmuch as the hospital must function continuously seven days a week. Especially is this true during the winter season when demands on us are the heaviest.

On July 1, 1931, there were 188 patients remaining in the hospital from the preceding fiscal year. During the year 4,740, including births, were admitted, making a total of 4,928 indoor patients under care, an increase of 13 per cent over last year.

Of the number admitted, including births occurring in the hospital, 798 were pay patients, 1,458 were indigent residents of the States, 2,484 were indigent residents of the District of Columbia.

There were discharged during the year, including births, 4,698, of whom 2,256 had recovered, 1,926 improved, 169 unimproved, and 347 died, leaving 230 in the hospital July 1, 1932, of which number 34 were pay patients.

The mortality rate was 6.6 per cent. This is not a high mortality in a general hospital such as this, particularly when it is considered

that 23 per cent of the deaths occurred within 48 hours after admission. Autopsies were performed on 38 per cent of the deaths.

There were 1,805 surgical operations with 40 deaths.

In the dental department 2,004 were treated.

Nine thousand six hundred and sixteen were treated in the out-patient department, and 5,668 in the emergency department, making a total of 15,284 as against 13,258 last year. Forty thousand and ninety revisits were made to the various clinics. The number of patients receiving the benefits of the hospital was 20,212 as against 17,594 the preceding year.

The work in the social service department progressed with satisfaction during the year. It is impossible, however, for two workers to begin to handle the great bulk of social-service problems with which this department is confronted at the present time.

The school of nursing had a very successful year. The appointment of an educational director was distinctly a step in advance, improving the educational aspect of the school.

Staff conferences were held weekly throughout the year, which proved to be most helpful.

An 8-hour schedule for student nurses was put in operation during the early part of the year, and its good results are very apparent.

The nursing service would be greatly improved if one graduate nurse could be employed for night duty on each ward. This would require 12 additional graduates, and an appropriation of \$15,000.

Receipts and disbursements, 1932

Receipts:

Appropriation, Interior act—

Salaries.....	\$197, 000. 00
For support.....	93, 000. 00
Clinical addition.....	97, 000. 00

387, 000. 00

Second deficiency act, 1931.....	65, 233. 38
From pay patients.....	18, 485. 50
From Veterans' Bureau.....	9, 799. 00
From Howard University.....	37, 166. 76

Total.....	517, 684. 64
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Disbursements:

Miscellaneous, appropriation (fuel, light, clothing, medicine, etc.).....	42, 782. 58
Miscellaneous, pay patients (fuel, light, clothing, medicine, etc.).....	14, 975. 29
Miscellaneous, Veterans' Bureau (fuel, light, clothing, medicine, etc.).....	9, 466. 21
Miscellaneous, Howard University (fuel, light, clothing, medicine, etc.).....	37, 152. 53

Disbursements:—Continued.

Subsistence appropriation.....	\$48, 543. 30
Salaries.....	191, 593. 24
Pay patients, subsistence.....	2, 979. 98
Obstetrical additions.....	65, 146. 44
Clinical addition.....	21, 947. 41
Refunds, pay patients.....	282. 25
<hr/>	
Total.....	434, 869. 23
<hr/>	

Unexpended balances:

Miscellaneous appropriation.....	717. 42
Subsistence appropriation.....	956. 70
Salaries.....	5, 406. 76
Pay patients, subsistence.....	247. 98
Veterans' Bureau.....	332. 79
Howard University.....	14. 23
Obstetrical addition.....	86. 94
Clinical addition (available for expenditure in 1933).....	75, 052. 59
<hr/>	
Total, unexpended balances.....	82, 815. 41

HOWARD UNIVERSITY

SUMMARY OF THE PRESIDENT'S REPORT

The Howard University was incorporated by the act of March 2, 1867 (14 Stat. 438). The object of the incorporation named in the first section of the act was "For the education of youth in liberal arts and sciences." It is declared that the incorporators shall be "a body politic and corporate with perpetual succession." The management and control of the institution are vested in a board of not less than 13 trustees; the full board, however, consists of 24 trustees.

Section 8 of the act providing for the incorporation of Howard University, above mentioned, was by act of Congress approved December 13, 1925 (45 Stat. 1021), amended to read as follows:

SEC. 8. Annual appropriations are hereby authorized to aid in the construction, development, improvement, and maintenance of the university, no part of which shall be used for religious instruction. The university shall, at all times, be open to inspection by the Bureau of Education and shall be inspected by said bureau at least once each year. An annual report, making a full exhibit of the affairs of the university, shall be presented to Congress each year in the report of the Bureau of Education.

Students.

The total enrollment of the university for the year 1931-32 was 2,464 students from 42 states (including the District of Columbia) and 17 foreign countries. At the June commencement 362 men and women received degrees in nine schools and colleges. Eighteen of these received the graduate degree of master of arts and master of science.

Outstanding events.

Among the outstanding events of the year 1931-32 were the following: The achievement of an approximate ratio of one to twelve between the faculty and the teaching load of the undergraduate colleges; the decided improvement in the graduate work leading to the master's degree; the strengthening of the faculty of the college of medicine, through five major appointments, four of which were of the young men trained especially for work in the departments of pharmacology, pathology, bacteriology, and physiology; a trained clinician and teacher appointed to professorship in medicine and head of the department of medicine; the institution of elective courses in this college; increasing effectiveness of cooperation between the medical

school and Freedmen's Hospital, the staff of the hospital being now composed almost entirely of the faculty of the school of medicine; the raising of the standards for admission into the college of dentistry and the substantial improvement of the physical equipment of this college; the sixtieth anniversary of the school of religion as a separate department of the university; the election of the law school to membership in the Association of American Law Schools; increased interest in graduate study and research on the part of the members of the faculty; the publication of articles and magazines of national educational interest at Howard University; an increase in the library facilities of the professional and undergraduate colleges, through the beneficence of private foundations; the completion and initial use of the three new women's dormitories.

UNDERGRADUATE COLLEGES

College of liberal arts.

Six hundred and seventy-eight students enrolled in the college of liberal arts. Three-fourths of the work in the college of education was done by this department, as well as one-fourth of the work in the college of applied science and in the school of music. This college also carries the main load of the graduate work. This year, for the first time in years, the teaching staff was approximately adequate to meet the demands of instruction. Degrees were awarded as follows: A. B., 44; B. S., 40; B. S. in commerce, 12.

College of education.

Seven hundred and forty-six students enrolled in this college. These students were taught by 14 full-time teachers, assisted by the staff of the colleges of liberal arts and applied science. The average teaching load has been reduced from approximately 370 student-clock-hours in 1929-30 to approximately 250 student-clock-hours in 1931-32. 1. A bureau of educational research has been established in the college of education. 2. The Quarterly Journal of Negro Education has been established and two issues have been published. This periodical, national in scope, is devoted to the dissemination of the results of such investigations as may be made in the field of Negro education at Howard University or elsewhere. Degrees were conferred as follows: A. B. in education, 112; B. S. in education, 20.

College of applied science.

One hundred and eighty-three students were registered for one or more courses in this college. The present teaching staff now consists of 17 teachers. The enrollment in the department of home economics for the year 1931-32 was double that of the preceding year; enrollment in the department of art this present year was also double that of the

preceding year; in the year 1931-32 approximately 15,000 individuals visited the Howard University Art Gallery. Degrees conferred in this college were as follows: A. B. in architecture, 1; B. S. in art, 1; B. S. in electrical engineering, 2; B. S. in home economics, 1; B. S. in civil engineering, 1.

School of music.

Sixty-one students enrolled for degree courses in the school of music. During the autumn quarter, however, 119 students were served; during the winter quarter, 122 students, and during the spring quarter, 119 students. Its department of violin increased almost 300 per cent in enrollment. Courses in the history and appreciation of music have been expanded to five hours per week. The department of public-school music is now well established and the degree of Bachelor of Music has been conferred. Degrees conferred as follows: Mus. B., 1; bachelor of school music, 2.

Graduate division.

There were 157 graduates in residence in the university during the school year 1931-32 in 16 departments. This total enrollment represents an increase of 77 over previous year, and this increase has occurred while the total university registration had suffered a reduction. The increase in the graduate division of the department of education since the year 1929-30 has been over 600 per cent. This natural development has been possible, partly through the increased demand for graduate work on the part of school teachers and most certainly through the additional time for graduate instruction on the part of the faculty of the undergraduate colleges, through reduction of student clock hours. Eighteen degrees were awarded, as follows: M. A. in English, 3; M. A. in psychology, 2; M. A. in Spanish, 1; M. A. in philosophy, 1; M. A. in education, 1; M. A. in German, 1; M. A. in history, 1; M. S. in psychology, 1; M. S. in physics, 1; M. S. in zoology, 4; M. S. in mathematics, 1; M. S. in botany, 1.

College of medicine.

Forty-four of the sixty students admitted into the college of medicine this year held the bachelor's degree, while all others had done three or four years of college work. There were 305 applicants for admission and 169 satisfied the minimum requirements, although the actual number selected had to be considerably less and was composed of students best fitted for the study of medicine. During the current year marked improvements were made in laboratory work in the courses of physiology, pharmacology, bacteriology, and pathology. The addition of the new 50-bed maternity wing to Freedmen's Hospital has greatly increased the facility for clinical teaching in obstet-

rics. The total number of deliveries during the school year was three times as great as that during the previous year. This year witnessed the establishment of a prenatal service, which has been expanded to 979 patients. The work of the obstetrical clinic has increased approximately 300 per cent. The department of pharmacology has obtained two grants for the continuance of investigations in the field of picrotoxin.

There is an encouraging growth in the medical library since 1929. The number of volumes has increased from 2,975 to 6,581 and the number of current periodicals from 62 to 135. Total enrollment, 218. Fifty-five were graduated in June with the degree of M. D. Of the 54 medical graduates in 1931, 49 were successful in securing general rotating internships at approved hospitals.

College of dentistry.

Postgraduate instruction in the college of dentistry has been considerably improved and all students of this department who have taken the Middle Atlantic State Board examinations have been successful. Over 50 per cent of the graduates of the college of dentistry in 1931 are at present engaged in postgraduate study. Improvement in the physical equipment of this college includes 3 surgical sinks; 40 clinical tables; bracket lamps for each chair in the clinics; 4 instrument and display cabinets; 50 special dental lockers for the students; filing cabinets and many smaller items.

Four thousand five hundred and eighty-two patients were served by university students in the dental clinics during the year. Degrees conferred as follows: D. D. S., 17.

College of pharmacy.

Total enrollment in this college was 33. Courses have been strengthened to meet the four-year curriculum requirements of the American Association of Colleges of Pharmacy. Courses in mathematics, physics, modern languages, zoology and advanced pharmacy have been added. Degrees conferred as follows: B. S. in pharmacy, 2; Ph. C., 7.

School of law.

Sixty-two students enrolled for study in this school. Entrance requirements were revised. Students from class A colleges may now enter with two years of college work. Students coming from a Class B college must present three years of college work and students coming from a college recommended for at least class B rating must present a Bachelor's degree. This revision of the entrance requirements removed the last obstacle in the way of the school's complete recognition by all the leading agencies in its field and it is now fully approved by them.

The Harvard University School of Law has awarded two fellowships for further study to instructors in the Howard University School of Law for the school year 1932-33. Degrees conferred as follows: LL. B., 17; certificate of law, 1.

Summer school.

Three hundred and fifty-one students from 29 States and 5 foreign countries attended the summer school of 1931. Twenty-four met the requirements for graduation—14 in the college of education, 10 in the college of liberal arts.

Library.

Four thousand eight hundred and twenty-one volumes were added to the general library during the year, making a total of 57,656 volumes. Four thousand two hundred and ninety-six of these volumes were received by purchase and 525 by gift.

Finances and property.

Howard University was incorporated in 1867, but the first appropriation for its support was made on March 3, 1879, when Congress appropriated \$10,000 for maintenance. Subsequently, Congress has made annual appropriations for Howard University, expendable under the supervision of the Secretary of the Interior, who is patron ex-officio of the board of trustees.

The report of the secretary-treasurer of the university covers receipts from all sources, including the Federal appropriations, donations, endowments, tuition, and other fees, etc. The total income for 1932 was \$1,719,201.44 and the total expenditures were \$1,745,197.55. The total assets in June, 1932 were \$7,828,952.90. Of this amount, \$1,071,895.47 represented assets in the physical plant extension fund made available from private sources, \$920,245.77 represented endowment funds, and \$5,094,167.56 represented the educational plant, including \$1,202,874.52 as the unexpended balance of appropriations from Congress for the chemistry, classroom, and library buildings, for the underground heat, light, and power tunnel; and for emergency construction.

The auditing of accounts has been done by certified public accountants. All moneys appropriated to the university by Congress have been expended under the supervision of the Department of the Interior.

COLUMBIA INSTITUTION FOR THE DEAF

SUMMARY OF THE PRESIDENT'S REPORT

During the fiscal year ended June 30, 1932, there were under instruction in the advanced department of the institution, known as Gallaudet College, 86 men and 62 women, a total of 148, representing 35 States, the District of Columbia, and Canada. This is an increase in pupilage of 16 as compared with last year. In the primary department, known as the Kendall School, there were under instruction 40 boys and 24 girls, a total of 64, 60 of whom were admitted as beneficiaries of the District of Columbia.

All students and pupils are under the charge of an experienced physician and directors of physical training. All are required to engage in exercise and sports, with the result that health has been excellent.

Courses of instruction have been the same during the year, with the exception that a summer school, beginning June 20, was given for the first time to deaf teachers of the deaf. It was attended by 43 deaf men and women from over 20 States in the Union, and seemed a very successful innovation.

The steady growth of the institution in pupilage calls for new buildings to relieve congestion in dormitories, and to provide better quarters for library and instruction purposes. A regular program for additional buildings has been worked out and steps should be taken to provide funds for this plan. As the institution carries on the higher education of the deaf, which is done nowhere else, and demands particularly well-prepared instructors, salaries of teachers should be made more adequate as well as the salaries of the clerical and other forces assisting in our work.

A definite start has been made on the proper inclosure of the grounds, which should be continued.

A day watchman should be added to the force for the proper care of the buildings and grounds.

Research work should be definitely established to assist in the understanding of the problems of deaf people, both in their educational work and in their industrial work after leaving school.

A successful meeting of the alumni of the college was held in June. The work of the institution was commended, and the alumni expressed the desire of more frequent meetings at the institution in the future.

At the close of the year an honorary degree of doctor of laws was conferred upon Dr. Vernon Kellogg, and an honorary degree of master of arts was conferred on Rev. Arthur D. Bryant. Degrees of master of arts in the normal department were conferred upon eight students, and master of arts in course upon two. Bachelor of arts degrees were granted to 10 students and bachelor of science degrees to 10. Dr. William John Cooper, United States Commissioner of Education, delivered the address to the graduating class.

EXTRA-DEPARTMENTAL ACTIVITIES

AMERICAN ANTIQUITIES

The act of June 8, 1906, entitled "An act for the preservation of American antiquities," provides, among other things:

SEC. 3. That permits for the examination of ruins, the excavation of archeological sites, and the gathering of objects of antiquity upon the lands under their respective jurisdiction may be granted by the Secretaries of the Interior, Agriculture, and War to institutions which they may deem properly qualified to conduct such examination, excavation, or gathering subject to such rules and regulations as they may prescribe: *Provided*, That the examinations, excavations, and gatherings are undertaken for the benefit of reputable museums, universities, colleges, or other recognized scientific or educational institutions, with a view to increasing the knowledge of such objects, and that the gatherings shall be made for permanent preservation in public museums.

SEC. 4. That the Secretaries of the departments aforesaid shall make and publish from time to time uniform rules and regulations for the purpose of carrying out the provisions of this act.

Archeological explorations.

The uniform rules and regulations promulgated by the Secretaries of the Interior, Agriculture, and War, pursuant to the above-mentioned act, under date of December 28, 1906, provided (par. 3) that—

Permits for the excavation of ruins, the excavation of archeological sites, and the gathering of objects of antiquity will be granted by the respective Secretaries having jurisdiction to reputable museums, universities, colleges, or other recognized scientific or educational institutions, or to their duly authorized agents.

Under the provisions of the above act the department consulting archeologist, Mr. Jesse L. Nusbaum, who is also director of the laboratory of anthropology, Santa Fe, N. Mex., renders advisory service to all branches of the department, as well as to scientific and educational institutions contemplating archeological investigations upon the public domain under the jurisdiction of the department. This official is also engaged in developing means and methods for the better protection and preservation of the many archeological sites located mainly throughout the Southwest, the prevention of unlawful excavation of these sites, the orderly conduct of work authorized by department permits, and the proper publication of the scientific information derived therefrom.

Permits granted.

During the year 20 permits were granted for the examination, excavation, and gathering of archeological specimens, as follows:

July 6, 1931, permit to George H. Sherwood, director, American Museum of History, New York City, to make an examination of the Triassic beds on the Little Colorado River near Cameron, Ariz.

July 10, 1931, to Dr. Byron S. Cummings, director, Arizona State Museum, Tucson, Ariz., to excavate a pueblo ruin near Fort Apache as a type ruin of the people once occupying the upper Salt River area.

October 21, 1931, to Donald Scott, assistant director, Peabody Museum, Harvard University, Cambridge, Mass., to explore in the drainage of the San Juan River, San Juan County, Utah; also in Coconino County, Ariz., in the Echo Cliffs region near Tuba City.

October 23, 1931, to Dr. Chester Stock, curator Los Angeles Museum of History, Science, and Art, Los Angeles, Calif., to conduct paleontological explorations and excavations for fossil dinosaurs in Emery County, Utah.

November 10, 1931, The Smithsonian Institution was authorized to carry on for three years on Kodiak Island and neighboring islands, Alaska, such archeological surveys and collections as considered advisable for locating and mapping all aboriginal sites in that locality.

November 23, 1931, M. R. Harrington, curator in charge, Southwest Museum, Los Angeles, Calif., was authorized to continue during 1932, reconnaissance work in Clark, Lincoln, and White Pine Counties, Nev., in search for further remains of pre basket-maker age; also to explore a cave known as Smith Creek Cave on the northern side of Smith Creek Canyon in White Pine County, near Baker, Nev.

December 29, 1931, permission was also granted to Mr. Harrington of the Southwest Museum continuing his authority to conduct archeological exploration of certain caves and rock shelters in Riverside and San Bernardino Counties, Calif.

January 7, 1932, additional permission was granted to Mr. Harrington of the Southwest Museum to conduct reconnaissance work on such lands in San Bernardino County, Calif., during 1932, as are under the jurisdiction of the Interior Department.

February 9, 1932, Edgar B. Howard, Museum of the University of Pennsylvania, Philadelphia, Pa., was authorized to conduct archeological work during 1932 in the following canyons of New Mexico, viz: Dark, Last Chance, Slaughter, Big Canyon, Little and Big McKittrick, and in smaller near-by canyons, this area being within that portion of the Guadalupe Mountains of southeastern New Mexico, withdrawn for consideration as an extension of the Carlsbad Caverns National Park area.

March 17, 1932, Horace F. Jayne, director, Museum of University of Pennsylvania, was granted a permit for Miss Frederica de Laguna, of the staff of that institution, to continue archeological investigations in the region about Prince William Sound and Cook Inlet in Alaska.

March 29, 1932, Emil W. Haury, assistant director, Gila Pueblo, Globe, Ariz., was authorized to conduct excavations and remove antiquities during 1932 from a cliff dwelling on the Fort Apache Indian Reservation in Gila County, Ariz., this ruin being located in T. 7 N., R. 15 E.

April 4, 1932, Harold S. Gladwin, director of Gila Pueblo, Globe, Ariz., was authorized to collect borings of wooden beams in the drainage of the upper Little Colorado; the San Francisco River, and the upper Gila River in Arizona and New Mexico during 1932.

April 12, 1932, the director of the Laboratory of Anthropology, Santa Fe, N. Mex., was authorized to continue during 1932 a surface survey of prehistoric

remains in New Mexico, Colorado, and Arizona on lands under the jurisdiction of the department.

May 5, 1932, to Albert B. Reagan of the Indian Service, Ouray, Utah, to continue archeological work during 1932, in the Uintah Basin, northeastern Utah.

May 10, 1932, J. D. Figgins, director of Colorado Museum of Natural History, Denver, Colo., was authorized to conduct archeological reconnaissance and excavations in the Big Horn Basin of northwestern Wyoming during 1932.

May 25, 1932, C. B. Osgood, instructor in anthropology, Yale University, was authorized to continue ethnological work for that university in Alaska during 1932; this work to be conducted in the drainage of the Yukon River.

May 26, 1932, Donald Scott, director, Peabody Museum of Archeology and Ethnology, Cambridge, Mass., was authorized to conduct archeological explorations during 1932 in the northern drainage of the San Juan River in San Juan County, Utah, and in Montezuma and Dolores Counties, southwest Colorado, easterly from Grand Gulch, Utah, and west of the Mesa Verde National Park; also permission to excavate at Cedar Ridge, northwest of Tuba City, Ariz., in Coconino County.

June 7, 1932, the Smithsonian Institution was authorized to conduct through Dr. F. H. H. Roberts of its staff, an archeological reconnaissance at one site, such site to be determined as a result of the reconnaissance in eastern Arizona in the area between latitude 35° and $35^{\circ} 30'$ and longitude 109° and $109^{\circ} 30'$, including a small portion of the Navajo Reservation.

June 14, 1932; the Smithsonian Institution was authorized to continue its explorations of the Oligocene deposits of South Dakota on the Pine Ridge Reservation, and collect fossil remains.

June 11, 1932, Mr. C. C. O'Harra, president, South Dakota State School of Mines, Rapid City, S. Dak., was authorized to continue during 1932 to collect fossils in the Pine Ridge and Rosebud Reservations of South Dakota.

During April, 1932, a conference was held by representatives of the War, Agriculture, and Interior Departments, and the Smithsonian Institution, upon the subject of securing better protection for American antiquities and more effective procedure under the act of June 8, 1906. After discussion of the conditions surrounding the enforcement of this law, the conference recommended the issuance of a standard application form for permission to conduct archeological excavations; also a standard form for issuing such permits, for the purpose of securing more definite and accurate information regarding each application, and the particular areas to be covered by the permits. Proposed amendments to the above law were also adopted for future consideration authorizing the arrest of persons found upon the public lands of the United States and in possession of archeological material for which they can not establish ownership or right of possession, and the seizure or impounding of same; also an amendment prohibiting the interstate shipment of archeological material except under permit issued by an authorized Federal or State officer.

The above recommendations were still under consideration by the departments concerned at the close of the fiscal year.

The annual report of the department consulting archeologist was not received in time for printing, and the manuscript will be retained in the files of the department.

GENERAL EDUCATION BOARD

SUMMARY OF THE CORPORATION'S REPORT

This corporation, which was created by an act of Congress approved January 12, 1903, section 6 of which requires the corporation to file annually with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation and the expenditure or other use or disposition of the same, or the income thereof, during the preceding year, has for its object the promotion of education within the United States.

On June 30, 1932, principal fund, belonging without restriction to the board, amounted to \$42,956,117.38. This fund is invested in stocks and bonds. In addition, the sum of \$21,139,496.09 is reserved to pay appropriations to various educational institutions, including \$6,907,300 appropriated during the year ended June 30, 1932. This fund is also invested in stocks and bonds. As prior years' appropriations in the sum of \$67,304.36 were lapsed during the year, the net increase in appropriations from principal was \$6,839,995.64. The sum of \$4,665,342.70 was paid during the year ended June 30, 1932.

Appropriations from income during the year aggregated \$3,908,-846.18. Lapses on account of prior years' appropriations amounted to \$461,261.80, however, leaving a net increase in income appropriations of \$3,447,584.38.

The income from the above funds, together with income from undisbursed income (and including the sum of \$318.70 received on account of income from the estate of Lucy M. Spelman), amounted during the year to \$3,650,683.44. The balance of income from the previous year as of June 30, 1931, amounting to \$12,870,640.23, together with sundry refunds, amounting to \$2,923.27, increased the total to \$16,524,246.94.

Disbursements from income during the year were as follows:

Whites:

Colleges of Liberal Arts—

Teachers' salary endowment and grants-----	\$933. 84
---	-----------

General endowment, build- ings, and other purposes--	165, 959. 83
---	--------------

\$166, 893. 67

Whites—Continued.

Science of education—

Schools of education.....\$100, 312. 50

Special projects.....316, 338. 70

\$416, 651. 20

Natural sciences.....64, 598. 37

Social sciences.....10, 282. 73

Medical sciences—

Schools of medicine.....472, 127. 95

Special projects.....31, 777. 19

503, 905. 14

Humanities.....301, 129. 21

Industrial art.....17, 877. 61

Public education—

Fellowships.....35, 800. 00

Special divisions in State de-
partments of education..185, 630. 94

Teacher training.....142, 526. 22

Library training.....54, 996. 56

Studies.....3, 478. 83

422, 432. 55

\$1, 903, 770. 48

Negroes:

Colleges and schools—

General endowment, build-
ings, and other purposes.....1, 075, 279. 21

Natural sciences.....9, 128. 76

Social sciences.....2, 500. 00

Medical sciences—

Schools of medicine.....297, 216. 64

Special projects.....734. 49

297, 951. 13

Public education—

Summer schools.....9, 400. 00

Anna T. Jeanes Foundation..61, 350. 00

County training schools....10, 600. 00

John F. Slater fund.....44, 775. 00

Rural school agents.....118, 815. 00

Fellowships.....52, 675. 00

Special divisions in State depart-
ments of education.....750. 00

Other purposes.....6, 850. 07

305, 215. 07

Miscellaneous.....11, 679. 11

1, 701, 753. 28

Surveys and studies.....55, 708. 90

Miscellaneous projects.....21, 845. 89

Administration.....278, 259. 85

Total disbursements from income.....3, 961, 338. 40

This leaves an undisbursed balance of income on June 30, 1932, of \$12,562,908.54, which is invested as follows: Securities, \$10,646,887.97; cash on deposit, \$1,620,614.24; and accounts receivable, net, \$295,-

406.33. It should be noted, however, that against this balance there are unpaid appropriations amounting to \$11,647,078.76, leaving unappropriated income amounting to \$915,829.78.

The Anna T. Jeanes fund, the income of which is to be used for Negro rural schools, amounts to \$207,784.16. It is invested as follows: Bonds, \$93,139.16; stocks \$16,645; and cash on deposit, \$98,000. The income from this fund during the year was \$9,079.31. Added to the balance from the previous year, the total available income amounted to \$13,827.13. Of this, \$9,299.07 was appropriated and paid to various schools, leaving a balance of \$4,528.06 accounted for in cash on deposit.

FUEL ADMINISTRATION AND BITUMINOUS COAL COMMISSION RECORDS

The records of the Fuel Administration and the Bituminous Coal Commission were transferred to the custody of the Secretary of the Interior under Executive orders of July 22, 1919, March 24, 1920, and June 16, 1920, and numerous requests for information therefrom and for certified copies of such records have been received. The records in question were for a time stored in temporary building No. 4, Twentieth Street and Virginia Avenue NW., and in the basement of the Southern Railway Building, at the corner of Thirteenth Street and Pennsylvania Avenue NW., but are now stored in the White House Garage, Twenty-first and L Streets NW., Washington, D. C.

THE PERRY'S VICTORY MEMORIAL COMMISSION

SUMMARY OF THE COMMISSION'S REPORT

The Twelfth Annual Report of the Perry's Victory Memorial Commission to the Secretary of the Interior for the year ended December 1, 1931, complied with the act of Congress (40 Stat. 1322) creating the commission in respect to filing an annual report of all financial transactions of the commission and stating "the condition of the said site and memorial as to preservation." The general condition of the memorial property was described as satisfactory in regard to permanence of construction and condition of the grounds of 14 acres and also in all details of upkeep, except as to the retaining wall on the north side of the memorial along the shore of Lake Erie. As in recent preceding reports, this wall was described as seriously deteriorating and requiring reconstruction as a measure of future safety to the property. The commission urged an appropriation of \$16,000 by Congress, based upon proper estimates, to provide a new wall, the construction of which at the earliest possible moment was particularly urged because of a new boulevard about to be built by the State of Ohio along this shore line, thus suggesting that the construction of the wall and the road should proceed together. The commission, however, now reports, under date of September 15, 1932, that legal technicalities raised by property owners on Put in Bay Island at points remote from the memorial have postponed the construction of the proposed road in front of the memorial until the autumn of 1932; and in consequence of this fact and in view of the determination of the commission, expressed at its annual meeting August 27, 1932, to seek action at the coming session of Congress for the purpose of better defining the status of the memorial as related to the National Government, the commission has withdrawn its request for the proposed appropriation for a retaining wall pending the result of its effort to thus provide a solution for all its problems of future operation of the memorial.

The formal dedication of the memorial occurred July 31, 1931, under the joint auspices of the memorial commission, the State of Ohio, and the Canadian Club of New York, the latter as indicating Canadian and British interest in the event, which witnessed the unveiling of a bronze tablet in the rotunda of the memorial commemorating and reproducing in full the Treaty of 1817 between the United States and

Great Britain, commonly called the Rush-Bagot agreement, providing for naval disarmament on the Great Lakes. Three other bronze tablets were unveiled at the same time, to wit: A tablet written by President Woodrow Wilson, the original text of which was purposed to be placed in the corner stone of the memorial, and was so placed, along with other historical documents, July 4, 1913; a tablet by President William Howard Taft, written for the same purpose and placed in the corner stone, and a tablet by Henry Watterson, who was vice president of the commission, written as a tribute to the building of the memorial, the text of which first appeared in his introduction to the History of the Memorial, published in 1917. The cost of the dedication and of the tablet commemorating the Treaty of 1817 was defrayed by an appropriation of the State of Ohio, and the cost of the other three tablets by private subscriptions obtained by the commission. The sum of \$928.54 was generously subscribed by members of the memorial commission as individuals for the various objects in connection with the installation of the tablets and the dedication.

Receipts from operation of the memorial have declined annually in very recent years and to an alarming extent in 1930 and 1931, while the commission's report for the year ending December 1, 1932, will show them to be at their lowest ebb in the history of the present commission or of the former interstate board which administered it prior to its taking over by the National Government in 1919. Drastic reductions in operating expenses have been achieved in all of the past three years, but without avail to prevent a correspondingly decreasing annual cash balance, which will be well nigh obliterated at the conclusion of the fiscal year of 1932. The receipts for 1930 were \$5,533.90, and the expenses \$6,219.51; cash balance at the end of the year, \$568.02; receipts for 1931 were \$5,436.90, and the expenses \$5,618.89; cash balance \$386.03. In these years, however, there was an extraordinary expense of laying a new telephone conduit through the memorial grounds and another for insurance extending over three years, so that the actual cost of operation was held practically within the total of receipts. But the season of 1932, detail figures for which are not yet available, will prove to be still more unfavorable, notwithstanding the most drastic reduction of operating expenses.

However, since 1921 expenses paid from earnings of the memorial for permanent improvements, for various necessary costs in carrying out Government contracts under appropriations by Congress for construction purposes, and in furtherance of the legislation necessary to obtain such appropriations have been in the aggregate \$17,897.52, as indicated in detail in the annual report of the commission to the

Secretary of the Interior for the year ended December 1, 1928; so that in the whole period of 14 seasons of the present commission's administration of the memorial up to and including the season of 1932 the memorial has shown in the aggregate a substantial profit over and above all operation expenses and present indebtedness, costing the Government not a dollar for operation or upkeep.

The commission concludes its financial statement of the report under consideration as follows:

Nevertheless, it is obvious that the present commission is confronted by the most critical period of its administration. We shall continue to do all that is humanly possible to make both ends meet, and are not pessimistic about the future; but if the time shall come when reliance must be placed on Government aid to operate the memorial, in addition to its earnings, we feel that, as an institution so well grounded in public esteem as to have held a large part of its former public patronage in a year like the present, it will be deserving of most liberal consideration by the national authorities.







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**ANNUAL REPORT
of the SECRETARY
OF THE INTERIOR**

for the FISCAL YEAR ENDED 1933
JUNE 30

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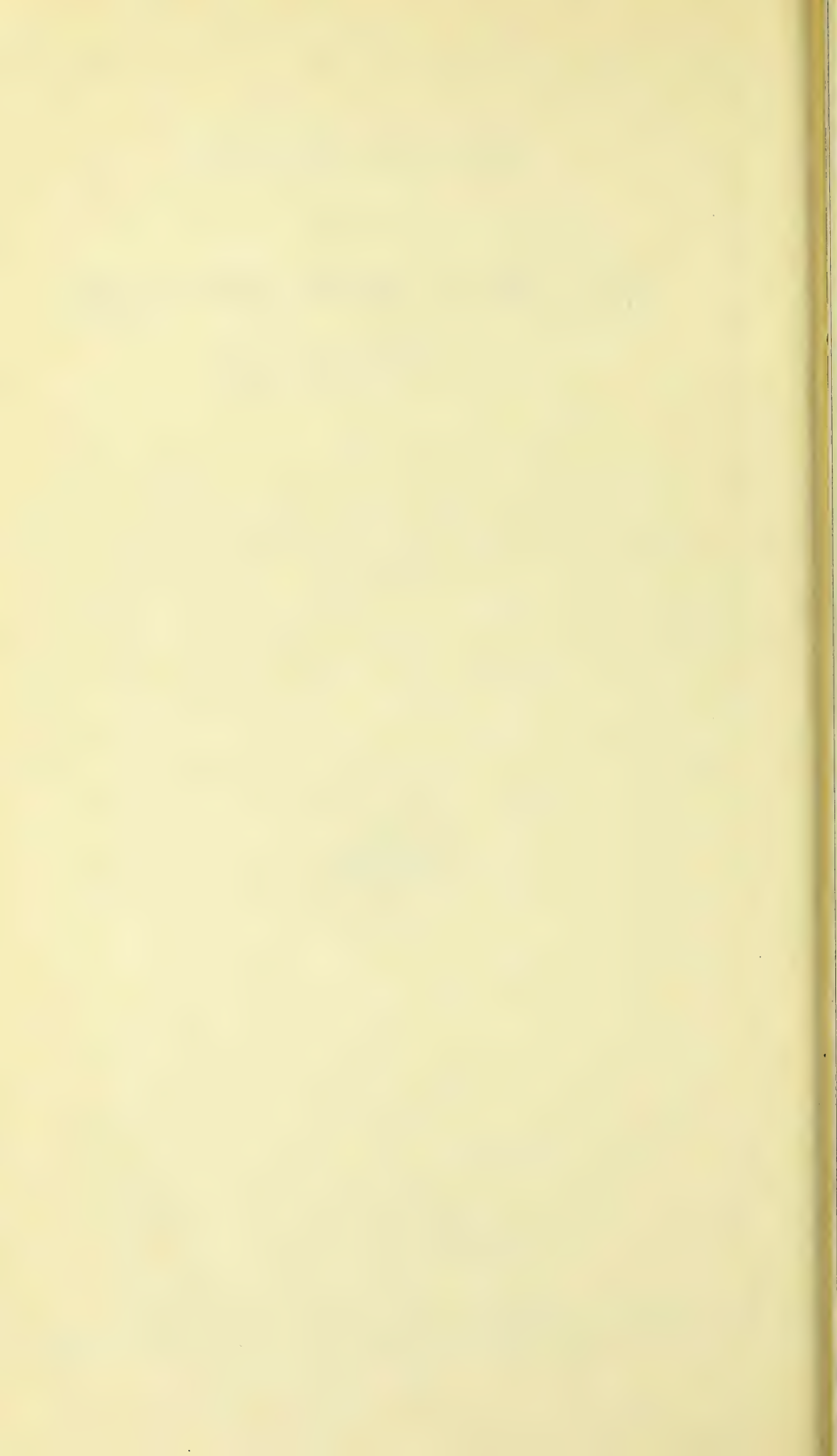
ANNUAL REPORT
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FOR THE FISCAL YEAR ENDED JUNE 30
1933

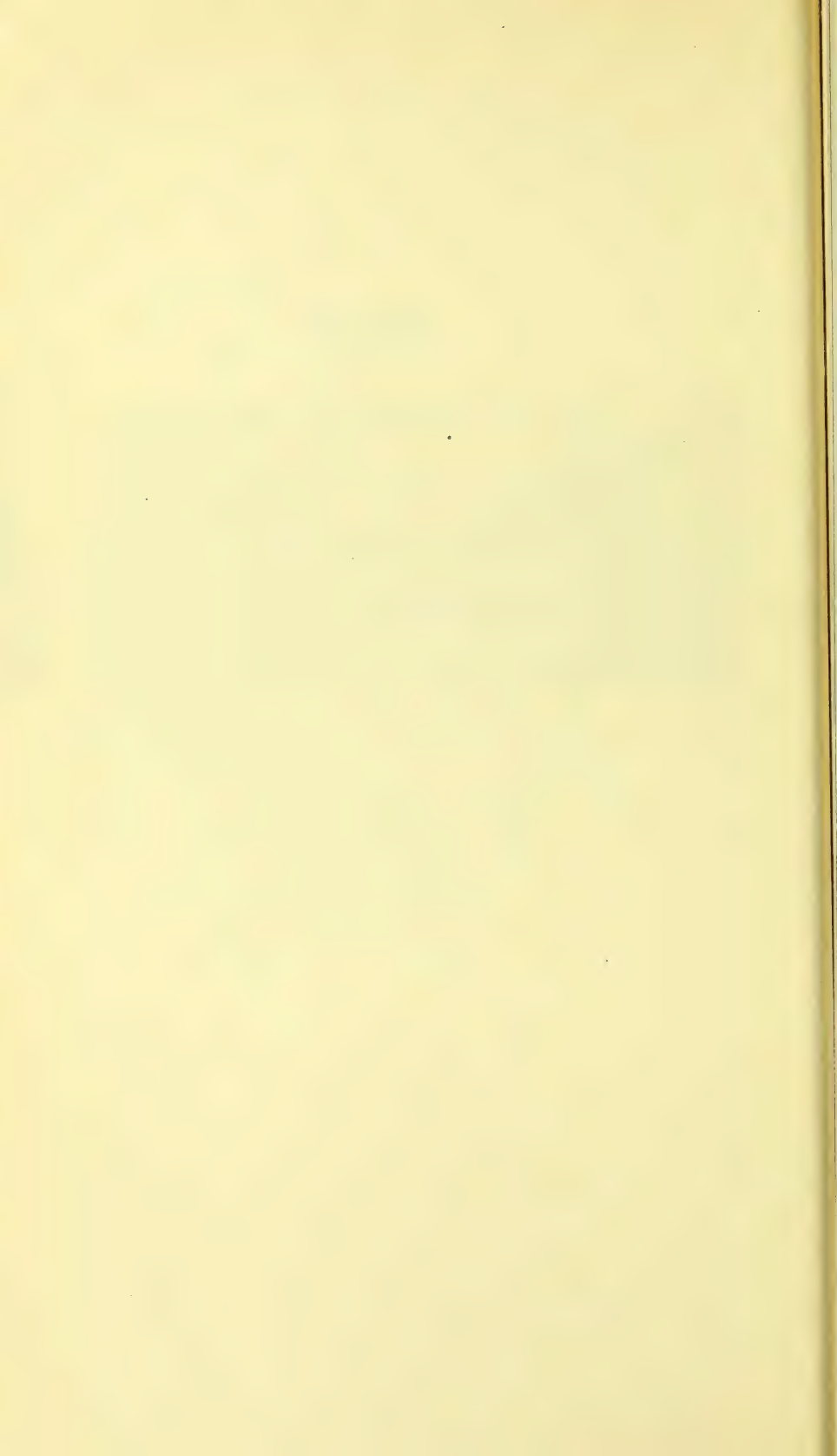


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LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington, November 30, 1933.

SIR: I have the honor to transmit my annual report for the Department of the Interior for the fiscal year ended June 30, 1933.

Very respectfully,

HAROLD L. ICKES,
Secretary

The PRESIDENT,
The White House.

▼

*THE REPORT OF
THE SECRETARY OF THE INTERIOR
TO THE PRESIDENT
FOR THE FISCAL YEAR ENDING JUNE 30, 1933*

The first annual report of a Cabinet officer assuming his duties with a new administration is necessarily brief, as the period covered is only from March 4 to June 30.

I will not attempt to interpret or give a résumé of the detailed reports of the various bureaus, divisions, and offices of the Department of the Interior contained herein. They will speak for themselves.

Under this administration several new administrative agencies have either been brought into the Department from other departments or have been newly created. These are:

The Bureau of Mines, retransferred from the Department of Commerce in anticipation of an Executive order to that effect to be issued later.

The Federal Board for Vocational Education which has been set up as a branch of the Office of Education.

The Office of Public Buildings and Public Parks of the National Capital.

The Soil Erosion Service.

The Subsistence Homesteads Division.

The Adviser on Economic Status of Negroes.

In addition to the foregoing, the Department of the Interior has been designated by the President as the Federal agency responsible for certain administrative duties under the petroleum code, and the Secretary of the Interior has been made administrator under the oil code as well as Administrator of Public Works. However, since all of these additional activities were brought under the jurisdiction of the Department subsequent to June 30, they are not discussed in this report.

The detailed reports of the various divisions of the Department have been materially cut down in volume in this report for reasons of economy. Full details of the activities of any part of the Department during the year covered by the report are available in the files of the Department to whomever may be interested.

THE SOLICITOR

The work of the solicitor's office shows a considerable increase during the fiscal year, notably in the matter of reports on proposed legislation, the number attaining a total of 982.

INDIANS

Two cases of outstanding importance affecting the jurisdiction of the Secretary of the Interior over the property of Indians of the Five Civilized Tribes in Oklahoma were decided by the Court of Appeals of the District of Columbia on April 3, 1933, namely, *King v. Ickes* (64 Fed. 2d, 979), and *Ickes v. Perry* (64 Fed. 2d, 982). The purpose of both suits was to compel the Secretary to release large sums of money held by him belonging to Indians of the Five Civilized Tribes of one half or more Indian blood. These funds were the proceeds from leases of restricted lands. The restrictions having been removed from the lands, it was contended that this operated to remove the restrictions from the funds. The decision of the trial court in one case was for and in the other against the Secretary. Appeals were perfected; and while the cases were before the appellate court, Congress enacted the act of January 27, 1933 (47 Stat. 777), section 1 of which declared that all funds then held by or which might thereafter come under the supervision of the Secretary belonging to Indians of the Five Civilized Tribes of one half or more Indian blood are restricted, and that all such moneys shall remain subject to the jurisdiction of the Secretary until April 26, 1956. The Court of Appeals ruled in both cases that this enactment applied to the funds involved in the pending suits and made them restricted and subject to the jurisdiction of the Secretary irrespective of whether the property was theretofore restricted or unrestricted.

IRRIGATION—BOULDER DAM PROJECT

Federal irrigation development by the Bureau of Reclamation and the Office of Indian Affairs continues to entail legal problems. During the year 12 cases were taken to the United States Circuit Court of Appeals for the Ninth Circuit and were decided in favor of the United States. The construction of Boulder Dam and appurtenant works, with a contemplated expenditure of \$165,000,000, produces many legal problems; and these come to the solicitor's

office. Complicated specifications and attendant contracts are examined, while purchase contracts of large magnitude must be passed upon. Questions involving conflicting rights between the States and the United States in the construction of the Boulder Canyon Project have been numerous. In the establishment of Boulder City and its government, questions of law have arisen concerning construction of waterworks, public buildings, streets, establishment and maintenance of schools, a police force, and the trial of cases involving misdemeanors.

OIL, GAS, AND OIL SHALE

Under the oil-conservation policy which became effective March 13, 1927, no oil and gas prospecting permits were issued. On April 4, 1932, the Department approved regulations providing for the issuance of permits on conditions giving the Department wide control over drilling and production as provided in the act of March 4, 1931. The result has been renewed activity in permits. In cases where these have been denied, appeals have been taken to the Secretary and have been considered in the office of the solicitor. The order of August 6, 1932, that the volume of oil produced be measured without deduction, except for the actual percentage of impurities, has had far-reaching effect.

The validity of the requirement that annual assessment work be performed in oil shale placer claims is before the office in a number of appeals from the decision of the Commissioner of the General Land Office. A suit for injunction restraining the Secretary from taking proceedings against these claims because of default in annual assessment work is now before the Court of Appeals of the District of Columbia.

WAR MINERALS RELIEF

During the year the office has actively participated in the trial of a number of cases arising under the War Minerals Relief Act of March 2, 1919, selected for hearing because they involved questions whose determination would enable the solicitor to dispose of other pending suits. The outstanding cases finally determined were two which involved the claim of the Chestatee Pyrites & Chemical Corporation. These cases were before the Court of Appeals of the District of Columbia and the Supreme Court of the United States several times, and were finally settled in accordance with the mandate of the Supreme Court. In the first of these cases (no. 335, decided January 16, 1933), the Supreme Court held that in claims presented under the War Minerals Act as amended February 13, 1929, purchase of equipment, salaries paid to executive officers, and similar items, might properly be included. In the second case (no. 767, decided May 29, 1933), the Supreme Court sustained the Secretary of the Interior in declining

to pay interest, amounting to over half a million dollars, claimed to have accrued after the enactment of the act of March 2, 1919, which permitted interest to be charged. Fifty-eight war mineral cases remain to be determined by the Secretary of the Interior. Four cases are now before the courts on appeal. The most important is *Ickes v. Cuyuna Mining & Investment Co.*, which probably will be heard by the Court of Appeals of the District of Columbia during its October Term. This case involves the question of the assignability of war minerals claims.

OTHER MATTERS

The reorganization of Federal functions has brought to the Department of the Interior additional activities—notably in the new establishment of the Office of National Parks, Buildings, and Reservations—which present for consideration many legal problems not heretofore within the assignment of the duties of the solicitor.

The following table shows work performed in the office:

Table showing work performed by office of the solicitor during fiscal year ending June 30, 1933

	Public-land matters		Indian matters	Miscellaneous matters
	Appeals	Motions		
Pending July 1, 1932.....	220	9	9	17
Received during year.....	811	111	11,951	9,821
Total.....	1,031	120	11,960	9,838
Disposed of during year.....	621	104	11,938	9,825
Pending June 30, 1933.....	410	16	22	13

“Miscellaneous Matters” include the following:

Formal opinions by the solicitor.....	61
Reports on legislation.....	982
Contracts for the erection of buildings, for building of roads, for supplies.....	1147
Cases prepared for submission to the Board of Equitable Adjudication.....	892
Oil and gas matters:	
Leases.....	23
Prospecting permits:	
Reinstated.....	9
Granted.....	1,149
Assignments.....	127
Extensions of time.....	1,466
Canceled.....	436
Coal matters:	
Prospecting permits.....	84
Licenses.....	32
Leases.....	35
Potash matters:	
Prospecting permits.....	78
Leases.....	3

WAR MINERALS RELIEF COMMISSION

(ROSCOE FERTICH, Commissioner)

The Secretary of the Interior under section 5 of the act of March 2, 1919 (40 Stat. 1272) was authorized to adjust, liquidate, and pay certain losses suffered by persons by reason of producing or preparing to produce certain minerals in compliance with the request or demand of named agencies of the Federal Government.

This act was amended February 13, 1929 (45 Stat. 1166) authorizing the Supreme Court of the District of Columbia to review the decisions of the Secretary of the Interior upon questions of law, with the usual right of appeal; but providing, also, that "the decision of the Secretary of the Interior on all questions of fact shall be conclusive and not subject to review by any court."

Under this amendment 337 petitions were filed, of which 5 have been dismissed by the court, and 173 decrees, mostly by consent, have been referred to the Secretary of the Interior for review. On June 30, 1933, 159 cases were pending in the court. At the beginning of this fiscal year there were 62 decrees pending action by the Secretary of the Interior; and, in addition, 52 decrees were handed down during the year. Under these decrees, 56 cases were considered, of which 53 resulted in awards, 2 in disallowances and one in a decision from which an appeal has been taken. There are 58 cases remaining for consideration by The Secretary of the Interior at the end of the fiscal year.

CONTROLLING COURT DECISIONS

The United States Supreme Court in the *Vindicator-Chestatee*, decided December 7, 1931, held that a claim under the act might properly include the purchase of property (land) and interest to March 2, 1919, on money borrowed and lost in operations; and, in the (second) *Chestatee*, decided January 16, 1933, held that expenditures for salaries of officers, legal services, taxes, and expenditures prior to stimulation were permissible; and, in the (third) *Chestatee*, decided May 29, 1933, held that interest paid or accrued was allowable only to March 2, 1919.

BUREAU OF RECLAMATION

(ELWOOD MEAD, Commissioner)

The area irrigated in 1932 with water from Government works was 2,769,605 acres, a decrease of 77,002 acres over that of 1931.

The area cropped was 2,775,280 acres, an increase of 3,096 acres.

The total value of crops was \$50,158,381, a decrease of \$23,801,996 compared with 1931, and of \$69,503,439 compared with 1930. This decrease in crop values was due largely to the agricultural depression and the prevailing low prices of crops.

During the period 1906, when water was first available, and to and including 1932, the cumulative value of crops grown on land irrigated from Government works amounted to \$1,886,048,258.

Construction payments in cash and credits from power and other sources received during the fiscal year 1933 were \$887,460.68, a decrease of \$616,990.75 compared with the previous year.

Payments for operation and maintenance were \$1,138,403.19, an increase of \$30,694.66 compared with the previous year.

Total payments amounted to \$2,025,863.87 compared with \$2,612,159.96 in 1931, a decrease of \$586,296.09.

Income to the Bureau from all sources during the fiscal year was \$4,688,255.57, or \$711,059.37 less than in the previous year.

The operation expense for the year was \$1,127,394.40, a decrease from the previous year of \$321,795.34.

Excess of operation and maintenance receipts over expense for the period amounted to \$11,008.79 compared with an excess of expense over receipts of \$341,481.21 for the previous year.

The appropriation available for construction was \$4,060,198.

The amount expended on construction was \$3,488,034.62 compared with \$7,255,188 the previous year.

Reduced revenues coming into the reclamation fund have brought about a sharp reduction in construction activities and unless some means be found for resuming work on a more extensive scale, funds that have been spent on storage works and canal systems will remain tied up until projects have been completed and water made available for the irrigable lands, and until water can be furnished, the Government is not in a position to call for the return of the construction costs. In other cases there is urgent requirement for the construction of storage reservoirs to provide additional water for well-developed

projects that are handicapped because of a shortage particularly after the middle of July.

The Boulder Canyon project comes under a separate authorization and appropriations for this work are made direct from the General Treasury. The Bureau has expended for surveys and investigations, construction, operation and maintenance, and incidental operations, \$278,500,000, distributed approximately as follows:

Surveys and investigations not allocated to primary projects.....	\$2, 900, 000
Construction of irrigation works, etc.....	226, 500, 000
Operation and maintenance.....	36, 900, 000
Incidental operations, plant and equipment, etc.....	12, 200, 000
Total.....	278, 500, 000

The relief acts of April 1, 1932, and March 4, 1933, granting to water users on Federal projects a suspension of payment of construction charges that became due in 1931, 1932, and 1933, resulted in a further reduction in reclamation revenues. Accretions to the revolving fund from the sale of public lands was \$293,863.78, which is a shrinkage of about one third of the revenues received from this source in the previous fiscal year, and from oil leases \$1,833,721, an increase of \$404,449. As a result of reduced revenues the appropriations available for carrying on work in the fiscal year 1934 are estimated as follows:

Direct appropriations.....	\$3, 003, 000
Unexpended balances continued available.....	1, 485, 245
Power revenues.....	405, 000
Funds to be advanced.....	539, 746
Total available.....	5, 432, 991

THIRD YEAR'S PROGRESS ON BOULDER CANYON PROJECT

Construction progress on Boulder Dam has been continued at the same rapid pace that characterized the work during the first 2 years and at the end of the year the contractor was approximately 18 months ahead of the original schedule. The river was diverted through the 50-foot tunnels in November 1932, the cofferdams completed during the winter months, the foundation excavation completed in the spring, and the first concrete placed on June 6. The contractors have planned to place the mass concrete in the dam—3,400,000 cubic yards—in 23 months, which is 9 months less than the time allowed in the first estimate.

The principal contracts awarded during the year covered the installation of the 150-ton permanent cableway by the Lidgerwood Manufacturing Co., the price being \$172,110. The Westinghouse Electric & Manufacturing Co., of East Pittsburgh, Pa., was awarded a contract for furnishing eight plate-steel cylinder gates, 34 feet in

diameter, for the intake towers, their bid being \$334,737. The Goslin-Birmingham Co., of Birmingham, Ala., has the contract for supplying entrance liners and other appurtenances for the intake-tower gates at a price of \$56,000. On February 3, 1933, bids were opened for furnishing hydraulic apparatus for the Boulder power plant, including four 115,000-horsepower and one 55,000-horsepower, vertical shaft, hydraulic turbines, with governors. The Allis-Chalmers Manufacturing Co., of Milwaukee, Wis., was awarded a contract for the four large wheels at \$1,087,600, and the Newport News Shipbuilding & Dry Dock Co., of Newport News, Va., was the successful bidder for supplying the small wheel at \$124,684. The Woodward Governor Co., of Rockford, Ill., is furnishing the five governors at a price of \$60,605.

At the end of the year specifications were being prepared for the furnishing and installation of four 82,500-kilovolt-ampere and one 40,000-kilovolt-amperes vertical-shaft alternating-current generators for the Boulder power plant. During the year 859,500 barrels of cement were purchased. A combination of four southern California mills—the Riverside Cement Co., California Portland Cement Co., Southwestern Portland Cement Co., and the Monolith Portland Cement Co.—furnished 782,000 barrels, while the Union Portland Cement Co., of Denver, Colo., was given a contract for 77,500 barrels.

CONSTRUCTION ON RECLAMATION PROJECTS DURING FISCAL YEAR

On the Owyhee project, Oregon, construction work has been in progress throughout the fiscal year. Owyhee Dam and the two long tunnels at the head of the canal system were completed. Contracts have been awarded for the first 10 miles of the main canal and good construction progress has been made. The Cle Elum Dam, on the Yakima project, Washington, was 94 percent completed at the close of the fiscal year. This is a rolled-earth and gravel-fill dam 135 feet high, 770 feet long, with a reservoir capacity of 435,000 acre-feet of water. On the Kittitas division of this project the Wippel pumping plant was completed and also the Badger Creek wasteway, while on the Kennewick division the Prosser Canal and power plant were put into operation. A power plant was also completed on the Grand Valley project in Colorado. On the Minidoka project, in Idaho, work was continued on the enlargement of the South Side Main Canal and lateral extensions on the Gooding division.

Drainage work was continued on the Sun River project, Montana; Rio Grande project, New Mexico-Texas; Klamath project, California-Oregon; Belle Fourche project, South Dakota; and the Willwood division of the Shoshone project, Wyoming. During the year 76 miles of canals and 109 miles of drains were constructed, making the total

to date 17,808 miles. The construction work at Boulder Dam increased the number of tunnels from 142 to 190 with a distance of 260,841 feet. There were 1,665 new canal structures built, 75 bridges, and 355 culverts. The Bureau has laid 4,792,055 feet, or 908 miles, of pipe; completed 1,498 miles of road, 120 miles of railroad, 4,086 miles of telephone lines, and 3,587 miles of transmission lines. Building these numerous canal systems has required the excavation of 319,004,119 cubic yards of earth and rock, and the placing of 5,651,168 cubic yards of concrete, in which 6,502,636 barrels of cement have been used.

ECONOMIC DEPRESSION

Farmers on Federal reclamation projects have felt the depression with a force equal to that experienced in other agricultural sections. One encouraging exception, however, is noted on the sugar-beet projects where the crop is contracted before planting and where is known within reasonable limits what is to be paid at harvest time. The average value of crops grown on all Federal projects in 1932 dropped to \$20.69, which is the lowest average during the entire existence of reclamation activities. Fortunately, there is very good evidence at hand to show that the bottom has been reached and that we have started on the upgrade. Early in the spring of 1933 there was a substantial increase in the price of dairy products, wool was being contracted at about double the price received the year before, the price of cotton had advanced, and, with increased prices being received from livestock, there was a corresponding increase in the selling price of alfalfa. The prospects for better prices for the 1933 crop were very promising, particularly for potatoes and beans, which are two of the important cash crops on northern projects.

A brief statement as to general trends in crop production during recent years gives some idea of the contribution of Federal reclamation to the agricultural life of the country and particularly to the unimportant part it plays in increasing the agricultural surplus. The area cultivated remains approximately four tenths of 1 percent of the total cropped area of the United States and about 1 percent of the value of all crops. Wheat has been decreasing in area and the production is now about three fourths of what it was 5 years ago. Cotton has also fallen off to approximately one half of the 1928 area. On the other hand, irrigated pastures, alfalfa, barley, and oats have been increasing year by year. These are the crops that are consumed on the farm and do not enter into competition with crops produced in humid sections. Potatoes and fruits have shown both increases and decreases in area and production during recent years, but the general trend has been upward. Sugar beets, also noncompetitive, which have shown an increase in area during the past few years, are still about

7 percent less than the maximum of 1929, although the average yield has increased about 25 percent.

Federal reclamation has furnished an important market for the sale of manufactured products in the 43,377 irrigated farms with a population of 181,007, and 227 cities and towns with an additional population of 515,423, which in large part have resulted from the construction of these projects.

MORATORIUM FOR WATER USERS

The act of April 1, 1932, granted to water users on Federal projects a moratorium on the construction charges that became due in 1931 and one half of the charges that became due in 1932. As the economic conditions that justified this moratorium still continued during the calendar year 1932, it was evident that further relief would have to be extended to the water users. A meeting of the Federal Irrigation Congress was held in Boise, Idaho, September 1-2, and resolutions were passed recommending a continued suspension for a term of 3 years, without interest, of payments on construction and other charges due the United States on Federal projects and that said charges, together with accrued interest, as well as interest that became due under the act of April 1, 1932, be deferred to the end of the contract repayment period on the projects. Several bills providing for relief were introduced in the Congress and hearings were held on January 25-27 before the Senate Committee on Irrigation and Reclamation, and on February 23 before the House Committee on Rules. Under date of March 3, 1933, Congress passed an act extending the provisions of the act of April 1 to include the remaining half of the charges due for 1932, and all similar charges to become due in 1933, such deferred charges to bear interest at the rate of 3 percent per annum, which rate was to apply to charges deferred under the first act which, by regulation of the Secretary, provided for interest payments at the rate of 5 percent per annum.

This moratorium resulted in a marked reduction in receipts to be credited to the reclamation fund and limited the amount appropriated by Congress for continuing the construction work, exclusive of sums carried over from previous appropriations, to \$2,065,000, which is about one third of the amount that would have been available under normal conditions. In order to offset this difference and give opportunity to continue work on the few projects that were not completed, an act was approved on May 12, 1933, which authorized the Reconstruction Finance Corporation, upon request of the Secretary of the Interior, to advance funds in an amount not exceeding \$5,000,000 for construction of projects or divisions of projects now under construction or approved and authorized. The funds so advanced were

to be repaid out of any receipts accruing to the reclamation fund within 5 years of the date of advance, with interest at 4 percent. It has not been necessary to take advantage of the provisions of this act nor is it expected that such action will be taken. The National Industrial Recovery Act approved June 16, 1933, authorized an expenditure of \$3,300,000,000, and plans were made for carrying on construction work on Federal projects with funds to be allotted by the Public Works Administration.

ADJUSTMENT CONTRACTS

MILK RIVER PROJECT, MONTANA

Contracts amendatory of the 1926 repayment contracts with the Malta Irrigation District and the Glasgow Irrigation District were entered into September 10, 1932, and September 20, 1932, respectively, which provided principally for adjustment of payments during the life of the original contracts. In spite of the very great reduction in the amount to be repaid during 1932, very few water users were able to meet the first payment due, and it was necessary that all districts accept the provisions of the moratorium act.

YAKIMA PROJECT, WASHINGTON

Adjustment contracts under the act of May 25, 1926, were completed with the 3 of the 6 small irrigation districts under the Sunnyside division of the Yakima project which had not previously contracted for extending the time for payment of construction charges. These districts were the Grandview, Snipes Mountain, and Outlook. The relief granted these six districts permits them to carry on without taking advantage of the act of April 1, 1932. However, at the end of the fiscal year four of these districts had filed applications accepting the amendatory act of March 3, 1933. The Sunnyside Valley Irrigation District secured relief under the original act, as did also some 80 percent of the individual water users on the Tieton division. Inasmuch as the charges covered by the amendatory act are not 12 months in arrears, little interest has been manifested in this act up to the close of the fiscal year.

SHOSHONE PROJECT, WYOMING

A supplemental contract dated June 3, 1933, was voted and signed by the Deaver Irrigation District, permitting the district to retain its construction collections during the next ten years and use them for additional drainage construction, which is badly needed. This district has a crop repayment contract, so that the period of repayment is automatically extended.

On April 12, 1933, a contract was made with the Shoshone Irrigation District whereby the district is relieved of paying construction assessments on State-owned land within the district which may not by law be subject to assessment by the district.

PROJECT SETTLEMENT ACTIVITIES

During the fiscal year 190 public land farm units, comprising a total irrigable area of 11,699 acres, were opened to entry as follows:

August 22, 1932, Lower Yellowstone Project, Montana-North Dakota, 4.

January 3, 1933, Belle Fourche Project, South Dakota, 2.

February 2, 1933, Pavillion and Pilot divisions, Riverton Project, Wyoming, 69.

March 4, 1933, Kittitas Division, Yakima Project, Washington, 47.

May 17, 1933, Gooding Division, Minidoka Project, Idaho, 68.

Owing to the depressed financial condition prevalent on a large majority of the projects there was little to encourage settlement of the vacant public lands. Results, however, would seem to justify the recital of a few exceptions to this rule.

On the Belle Fourche project the season of 1933 showed a satisfactory increase over that of 1932 in point of new settlers and in the area under cultivation, and although there was an absence of much needed capital, the settlers were improving their farms, their indentedness was inconsequential, and they were able to face the future with confidence.

There was much demand for the farms on the Kittitas division of the Yakima project, and from January 1 to the close of the fiscal year 30 families located in the valley. Of the 47 farm units opened to entry on March 4, 88 applications had been received to June 30, and 38 of these applicants made entry.

Irrespective of economic conditions similar to those existing on the other projects, the Riverton project closed the fiscal year with the addition of 12 carefully selected settlers.

In spite of the low prices received for farm products on the reclamation projects, in general the morale of the settlers has not been seriously disturbed, and in the realization that their condition compares favorably with that of farmers in other sections of the country where crop prices have been at an exceedingly low ebb, they have taken on new hope and have determined to fight the depression to a finish.

CONTRACTS

The following summary shows the nature of the contracts entered into by the Bureau during the fiscal year, their number, and the amounts involved:

Nature of contracts	Number of contracts	Amount involved
Cooperative investigations.....	2	\$24,000.00
Supplies.....	529	755,243.21
Material.....	184	898,098.11
Equipment.....	96	1,622,113.41
Miscellaneous services.....	101	39,213.14
Construction work.....	24	11,336,316.56
Land purchases, including improvements.....	66	167,947.73
Land sales, including improvements.....	6	806.20
Leases to the United States.....	21	11,422.55
Leases from the United States.....	418	141,518.95
Compromise of damages.....	11	2,031.14
Rental of Government equipment.....	6	799.00
Rental of water.....	325	175,248.44
Sale of surplus electrical energy.....	49	121,688.12
Sale of water rights to towns.....		
Sale of water rights under the Warren Act.....	1	469.20
Sale of water rights within projects.....	8	4,961,184.12
Adjustment and relief.....	1	(1 ²)
Transfer of project operations.....	1	
Miscellaneous.....	106	70,996.37
Total.....	1,955	\$20,329,096.25

¹ This represents contract with Shoshone Irrigation District, Shoshone project, Wyoming, covering suspension construction charges unsold State lands.

² Deferments under moratorium acts of Apr. 1, 1932, and Mar. 3, 1933, not included under this item.

³ Estimated in part.

ECONOMIC AND ENGINEERING OPERATIONS

SALT RIVER PROJECT, ARIZONA

The effects of the prolonged economic depression have been severely felt in all activities, rural, urban, and suburban, throughout the project and vicinity. Construction was practically at a standstill during the year, the State's largest industry, copper mining, was almost completely shut down, and the prices of agricultural commodities were the lowest of record. There was no advance in agricultural development and no market for farm property, or, for that matter, any other kind of property.

The collapse of the mining industry seriously affected an important market for farm products in the mining towns, and the shutting down of the mine plants cut off one of the most important markets for hydroelectric power from the project system. These revenues, formerly depended on to defray a considerable part of operation, maintenance, and overhead expenses, had to be made up by direct assessments. Under the circumstances banks were more conservative in extending credit, resulting in some increase in the amount required to be provided in cash for current financing, over normal times. The meeting of current expenses, plus a large floating indebtedness would undoubtedly have resulted disastrously for many landowners, but for a loan of \$880,000 from the Reconstruction Finance Corporation, made on notes signed by the individual shareholders, endorsed by the association as an organization. This enabled the association to pay its outstanding notes, and to acquire the stock of the locally

organized "Agricultural Credit Finance Corporation", with a paid-up capital of \$350,000, which sum was thus made available for crop and water loans to association shareholders. This relief undoubtedly saved many farms from foreclosure.

The increase in water stored in the four reservoirs on Salt River and in the underground gravels tapped by the project irrigation pumps, which resulted from the river flow of early 1932, made it possible to discontinue pumping during that year, except as needed for drainage. Failure of fall and winter rains to follow this run-off, however, made it advisable in 1933 to again draw heavily on the irrigation pumps in order to conserve surface storage waters. As a result, at the end of June 1933 the quantity stored was still 1,000,000 acre-feet, approximately 250,000 acre-feet less than at that date in 1932. This is a fairly satisfactory condition, assuring an adequate reserve at the end of the time of heavy use, September 30, with possibility that fall and winter run-off may reduce the amount required to be pumped in 1934.

YUMA PROJECT, ARIZONA-CALIFORNIA

The slight advance in prices received for farm products, particularly during the last 6 months of the fiscal year, and the more economical methods of farming which of necessity were adopted by the farmers, contributed to the slight improvement in the general financial condition of the project water users over that of last year. The relief from reclamation charges afforded by the acts of April 1, 1932, and March 3, 1933, has been of very material assistance to water users. Additional relief in the form of reduced operation and maintenance charges, made possible by the drastic economies practiced by the Bureau, has also been of assistance.

A preliminary survey now indicates that approximately 14,000 acres have been planted this year, as compared to 9,918 acres in 1932, 18,895 acres in 1931, 28,073 in 1930, and 36,029 in 1929. Of this year's crop, approximately 3,000 acres have been signed up for destruction under the plan of the Cotton Administration of the Farm Relief Act.

Under the contract of February 5, 1931, the Yuma County Water Users' Association makes all collections from individual water users in the valley division, containing 47,372 irrigable acres. As of June 30, 1933, the association had paid all O. & M. bills for the division, and had cleared for water, having paid in advance all individual assessments due, 42,579 acres, or 90 percent of the lands in the division. Of the 13,467 acres in the Reservation division, 93 percent are eligible for water at this time.

ORLAND PROJECT, CALIFORNIA

The unfavorable economic conditions of the previous year continued to a greater degree throughout 1932 in that prices for all farm products, with but few exceptions, were lower. As a result of an ample water supply, crop yields were uniformly high, but prices were ruinously low.

Collections of reclamation charges, aggregating \$52,285, compared favorably with those of the preceding year (which were only \$3,500 more), especially in view of the low prices received for farm produce generally and the fact that payment of nearly \$69,000 of construction charges was deferred under the relief act of April 1, 1932.

The crop value of \$24.43 per acre for 1932 is the lowest in the 22 years of the project's operation with the exception of the drought year of 1924. Farm equipment depreciated about 25 percent in value, while values of livestock decreased over 50 percent, owing partly to a reduction of nearly 500 cows among the dairy herds of the project.

Reduction in available funds made it mandatory to curtail concrete lining operations on the project to 450 linear feet of laterals subject to excessive loss of water and high maintenance cost. Broken control parts on the 42-inch needle valves at Stony Gorge Dam were replaced.

GRAND VALLEY PROJECT, COLORADO

There were 459 farms irrigated during the 1932 irrigation season. The average crop value per acre was \$16.26 as compared with a 10-year average of \$35. This extremely low return was caused entirely by low prices for all farm products. Yields were normal for the year and sufficient irrigation water was available for all needs. The average water user has adapted himself to the changed conditions and has cut his cost of production to the minimum.

A number of land transfers were made by local people during the year at very low prices. The price of farm lands ranged from \$5 to \$75 per acre depending on the soil qualities, improvements, location, etc. The beet-sugar factory at Delta processed all beets grown in the territory, and the Grand Junction factory remained idle. Sufficient acreage was contracted for the 1933 season to insure the operation of both factories.

During the year the Grand Valley power plant was constructed at a cost of approximately \$209,000. All funds in this connection were advanced by the Public Service Co. of Colorado and the plant was turned over to the company for operation on April 1, 1933.

UNCOMPAHGRE PROJECT, COLORADO

During the 1932 irrigation season 1,592 farms were irrigated. Of this number 782 were farmed by owners and 810 by tenants.

The average crop value per acre was \$11.84, which was only about one half the previous lowest return in the history of the project. This ruinously low return was due entirely to low prices received for agricultural products. All principal crops brought the lowest returns of record, with the result that no general project revenue was available from any source. A few farms were transferred by purchase and others by foreclosure, but no settlement activity was noticeable. The price of farm land ranged from \$25 to \$150 per acre, depending upon the quality of the soil, improvements, and location with reference to shipping points.

BOISE PROJECT, IDAHO

Farmers on the project have been handicapped by low prices for produce. Prunes, apples, and potatoes on many ranches were left unharvested because of lack of demand: As a result, farm financing has become a problem. There have been few sales, but a fair demand for rentals. Cooperatives have been active. The project continues to produce diversified crops and dairy products, with about half the project acreage in alfalfa hay and pasture.

KING HILL PROJECT, IDAHO

There were 122 farms on the project operated by owners and 70 by tenants. There has been an increase in the demand for rented farms, but in too many cases by persons without sufficient funds and equipment to carry on farming operations.

As a result of the poor market for potatoes in 1932, there was a reduction in acreage this year, with a demand for early potatoes that was encouraging, although shipments had been limited to the markets that could be reached by trucks. There has been an increase in the area of small grain and all crops are looking better than in 1932. Alfalfa that survived the freezing weather is doing well, but much of this crop was killed during the long and very cold winter months.

The canal system is in need of the replacement of some important structures comprising siphons, repairs to concrete flume floors, and headgates on the main canal.

MINIDOKA PROJECT, IDAHO

There were 2,384 farms irrigated on the old divisions of the project as compared with 2,285 during the preceding year. The number of irrigated farms is divided between the gravity and pumping divisions in the proportion of 1,522 on the former and 862 on the latter. There was little change in tenantry, about 40 percent of the farms being operated by tenants and 60 percent by the owners. Sales of farm property were comparatively few and prices were only fair.

Most crops produced good yields in 1932, but prices were very low. The total crop value was \$1,444,575, or an average of \$14.50 per acre. Sugar beets, with an average yield of \$78 per acre, proved to be the most profitable crop. Most of the other farm products, however, especially potatoes, declined in price to such an extent that they yielded little or no profit. In spite of these conditions, collection of operation and maintenance charges on both the gravity and pumping divisions has been gratifying. Most of the construction charges either have been postponed or have been paid out of power profits.

It is estimated that 30,242 acres on the Gooding division were irrigated with water from American Falls Reservoir, there being 134,000 acre-feet of storage delivered to these lands. As a result, the water supply for lands both above and below the Milner-Gooding Canal was more than doubled and the crop yields increased accordingly.

BITTER ROOT PROJECT, MONTANA

The money loaned by the United States to rehabilitate the project has had a most encouraging effect. During a number of years the uncertainty as to whether the project could finance itself to reconstruct many old wooden structures had caused much land to become tax delinquent to the extent that it was taken over by the county. During the past year many new settlers have purchased these lands in small tracts and are building their homes. These people are coming from the mining and dry-farming regions. There is also evidence of new building and other improvements by the original landowners.

The prices prevailing for farm products have reduced the farmers' income in most cases to less than the cost of production and, notwithstanding lower overhead expense, a condition making difficult the meeting of water assessments has resulted. Employment of landowners on new construction work helped the tax payment situation to some extent. The district's income from water charges was 60 percent of normal. The Bitter Root Irrigation District has an irrigable area of 18,240 acres. In 1932 there were 227 farms with 15,374 acres of land cropped and irrigated, a slight increase over the preceding year.

HUNTLEY PROJECT, MONTANA

During the 1932 irrigation season 649 farms were irrigated. Of this number 324 were operated by owners and 325 by tenants. The general population trend, back to the farm, held true for the Huntley project. The annual census showed an increase in the farm population of 513 during the year and an increase in the town population of 80, making a total increase for the project of 593.

The average crop value per acre in 1932 was \$24.84, which is the lowest in the project's history with the exception of 1921. The water supply was adequate at all times and yields were good, the

low value being due to depression prices. Sugar beets were the principal cash crop and provided 72 percent of the total income from the farms. The yield of this crop was 2 tons per acre above the average.

MILK RIVER PROJECT, MONTANA

The year of 1932 was favorable for crop production and yields were somewhat above normal. The general low price level of all farm produce, however, resulted in a crop revenue far below that of several years past. The sugar-beet acreage was the largest and yields were the best in the history of the sugar industry on the project. Although an unusually low price was received by the farmers for beets, this crop was the only one that yielded a profit to the producer.

Contracts, amendatory of the 1926 repayment contracts with the Malta and Glasgow irrigation districts, were executed during the year, which provided principally for an adjustment of payments during the life of the original contracts. In spite of the very great reduction in the amount to be repaid during 1932, very few water users were able to meet the first payment due, and it was necessary that all districts accept the provisions of the Moratorium Act.

About 80,000 tons of sugar beets were refined by the Chinook factory of the Utah-Idaho Sugar Co., which constituted the greatest volume of any campaign in the life of the industry upon the project. Slightly over 10,000 acres are contracted for 1933, which, with the crop prospect now in sight, should yield a tonnage at least equal to the capacity of the mill, during a normal operating season. Major repairs to the plant are being made, however, which are designed to increase its daily output, and it is anticipated that the crop can be handled without difficulty.

SUN RIVER PROJECT, MONTANA

The program followed since 1929 of changing the large grain acreage to alfalfa, sweetclover, forage, and cultivated crops was continued during 1932. Good progress was made as evidenced by the fact that at the end of 1932 there were 2,561 acres in sweetclover, 12,716 acres in alfalfa, 400 acres in potatoes, 100 acres in corn, compared to the year 1929, when there were 1,148 acres in sweetclover, 4,893 acres in alfalfa, 43 acres in potatoes, and none in corn. In 1933 considerable interest was aroused in the raising of sugar beets and 80 acres were contracted. That the nearest sugar factory at Chinook now has more than 10,000 acres under contract and the freight charge from the Sun River project amounts to about \$1.30 are indications that a factory will have to be located near the project before sugar-beet raising can be extensively adopted.

The Fort Shaw division was successfully operated by the Fort Shaw Irrigation District. The Greenfields and Big Coulee divisions

as well as the main canals and storage works were operated in an efficient manner by the Greenfields Irrigation District. During the last half of the calendar year 1932 the W. H. Puckett Co., of Boise, Idaho, constructed 16.2 miles of drains which were urgently needed to protect and reclaim lands from waterlogging. Additional drainage work should be done in the very near future to protect additional lands from waterlogging.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

There were 481 irrigated farms on the project. In addition 54 farms were wholly dry, with small returns. The area irrigated was 31,235 acres, which was about the same as the previous year. The total area assessed for charges was about 44,000 acres. This figure includes roads, laterals, and farmsteads, so it is probable that an area of about 6,000 acres susceptible of irrigation was not being irrigated. A large percentage of this acreage is very undesirable for irrigation.

During the current year 55.3 percent of the irrigated farms were operated by owners or managers compared to 54.7 percent the previous year. No attempt has been made to encourage settlement owing to the depressed agricultural condition. The irrigation districts made no sales of lands taken over for nonpayment of taxes. Two contracts for sale were canceled and one farm was purchased because of the nonpayment of taxes.

In spite of the low prices received for farm products the financial record of the district was satisfactory. Both districts raised sufficient money to keep the operation and maintenance work on a cash basis.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

The run-off of the North Platte River for 1932 was slightly above normal and the irrigation water supply was ample. The area irrigated was about the same as that of the previous year. All of the irrigation districts, except Pathfinder, delivered water to all lands not in arrears for more than 2 years in the payment of water charges, and this policy no doubt resulted in a larger area being watered than would otherwise have been the case. Yields of all crops, with the exception of potatoes, which were poor in quantity and quality, were normal or better. Prices received for all farm products were low. The price paid for sugar beets at the time of harvest was \$4 per ton. An additional payment of about 40 cents per ton was made in June 1933 and a small additional payment may be made if the price of sugar remains favorable. On account of their previous good financial condition, all of the irrigation districts, except Northport, were still on a cash basis. Power credits and the moratorium acts have taken care of construction payments. The Northport district continues

to be in a precarious financial condition and additional assistance is needed.

The only construction work undertaken by the Bureau was the building of approximately 11 miles of 33,000-volt transmission line between Lingle power plant and the town of Torrington, Wyo. This line was about 75 percent completed at the end of the fiscal year. The irrigation districts excavated 13 miles of new drain ditches for the protection of irrigated lands.

NEULANDS PROJECT, NEVADA

The water supply was ample for irrigation of lands in the Carson division, but the extremely low elevation of Lake Tahoe and a deficient run-off into the Truckee River necessitated the purchase by the irrigation district, at heavy expense, of privately owned stored water in Donner and Independence Lakes for use on bench lands under the Truckee Canal during the 1932 season. In order to prevent a shortage of irrigation water for the Fernley and Hazen districts after July 15, 1933, negotiations were again in progress at the end of the fiscal year for a similar purchase. The installation of a pumping plant to pump water from Lahontan Reservoir into the lower end of the Truckee Canal for irrigation use on the Swingle Bench area was undertaken. Run-off in the Truckee and Carson Rivers was retarded and greatly reduced during the spring of 1933 on account of cold, unfavorable weather.

The irrigated area on farms totaled 44,304 acres, in addition to which 7,623 acres in outside community pastures received some regulatory and drainage waters for irrigation. Farms operated by owners numbered 525 and by tenants 182. During the year the directors of the district authorized the sale of water rights for a number of small tracts of privately owned land upon which drainage and other district charges had been assessed, but no new water-right applications were completed. Crops with a total estimated value of about \$516,500 were harvested during 1932. This was a decrease over the crop value of the preceding year of \$222,500, although the yields were considerably greater. Alfalfa production, stock feeding, and dairying continued to be the major agricultural pursuits.

Faced with the prospects of another severe water shortage on the bench lands, the board of directors of the district on May 1, 1933, authorized the construction of the Lahontan-Swingle Bench pumping plant. The installation of this plant, at a cost of approximately \$11,000, was completed on June 30. The capacity of the plant is about 70 cubic feet per second and the equipment comprises two 20-inch centrifugal pumps and motors. Operation of the plant was commenced on July 9, 1933, water being pumped from Lahontan Reservoir, through connections with the 78-inch power penstock, into the lower end of the Truckee Canal.

CARLSBAD PROJECT, NEW MEXICO

There were 438 farms cultivated during the year, of which 279 were cultivated by owners or managers and 159 by tenants. The total area irrigated was 24,760 acres. Prices of farm lands ranged from \$100 to \$250 per acre. There were no farms sold during the year. About \$650,000 was borrowed from the Federal land bank. Considerable difficulty in meeting mortgage payments was experienced by farm owners and the delinquency at the close of the year was about 60 percent. Crop yields for 1932 averaged \$19.59 per acre, or \$10.67 less than the low value of the previous year and the lowest since the early years of the project. Financial conditions were serious throughout the year. The local bank deposits as of June 30, 1933, were \$460,000. Very few loans were made by the local bank and none for crop production. Loans totaling about \$60,000 were made by the loan agencies of the Government, namely, the so-called "seed loan" and the "agricultural credit agency" of the Reconstruction Finance Corporation. Prices for staple crops had improved at the end of June.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

Practically all of the project is in private ownership and approximately 90 percent was in cultivation. The number of irrigated farms increased from 4,496 in 1931 to 4,557 in 1932. However, the cropped area was reduced from 137,378 to 134,531. This reduction in area was brought about by lack of finances among the water users. Only 2,846 farms, or 62 percent, were farmed by the property owners, and 1,711, or 38 percent, by managers and tenants. The farms average from 60 to 120 acres in size. However, the average size is reducing every year, owing to subdivision of properties into suburban tracts near El Paso.

Crop financing has become more difficult to obtain through private sources each year and as a result the Federal seed and other Federal loan agencies have been freely used to finance the 1933 crops. The financing of these crops on the whole is an improvement over the previous year even though the general depression and economic conditions have not improved. The area contracted for irrigation on June 30 this year was 131,826 acres as compared to 110,298 acres on the same date last year. The irrigation districts are issuing special permits to users to receive water and on June 30, 1933, there were 10,598 acres receiving water in this way as compared to 36,661 acres on June 30, 1932. The condition of the banks is very good. One of the project banks was closed for about 6 weeks after the revised banking laws became effective in March of this year.

There were 4.07 miles of intercepting drain constructed in the Elephant Butte Irrigation District in connection with levee recon-

struction during the year. This will provide drainage for about 200 acres and will furnish flood protection to the adjacent lands of a much greater area. In the El Paso County Water Improvement District No. 1, there was constructed 3.28 miles of spur drain which will furnish complete protection for about 600 acres that were only partly protected by the existing drains.

BAKER PROJECT, OREGON

Construction of this project was approved by the President March 18, 1931. The plans provided for furnishing a supplemental water supply to an area of 7,000 acres of land in lower Powder River Valley, about 18 miles northeasterly of Baker City, Oreg., already settled and partially served with water from canals diverting from Powder River. The lands are now farmed to the limit of the available water supply, and the increased crop production to result from the supplemental water supply will, it is believed, be reflected in an increase in crop values much larger than the cost of the proposed irrigation works.

UMATILLA PROJECT, OREGON

Since the reclassification and cancelation of certain lands within the district in the east division, the irrigable area amounts to approximately 10,940 acres, for which the distribution system is prepared to deliver water. The area irrigated is about 7,300 acres.

Although the operation and maintenance assessment was reduced by 20 percent over that of 1931, payment of this charge in the west division would have been impossible for three fourths of the farmers had they not received seed loans. Many head of livestock were sold at a very low price in order to avoid further losses in feeding. Turkeys alone paid a small margin over feed costs.

VALE PROJECT, OREGON

Public Order No. 6, issued March 23, 1933, established water rental charges for the irrigation season of 1933, for the Harper and Little Valley, Bully Creek West Bench, and Bully Creek East Bench units. Good progress was made by the settlers despite the unfavorable conditions which obtained during the past year. Approximately 5,000 acres were seeded to crops by 118 settlers during the season and development of new lands continued. About 2,000 acres of land now in sagebrush were contracted for purchase during the last month of the fiscal year. With few exceptions the farms are being operated by the owners. Crop yields have been good, but prices were low for all farm products and there was no sale for onions and potatoes.

The Vale-Owyhee Land Settlement Association continued to function throughout the year, being active in securing a number of new settlers on the project. The advertising conducted by the association

in conjunction with the On-to-Oregon advertising campaign of the Oregon State Chamber of Commerce resulted in the receipt by the association of 1,050 inquiries and calls at the office of the association and the project superintendent of about 200 interested persons. No cooperative associations have yet been formed on the project. Two excellent highways traverse the project and a State highway extends through the project lands.

KLAMATH PROJECT, OREGON-CALIFORNIA

The main division of the project contains 578 farms, 526 of which were farmed during the calendar year 1932. Of the farms irrigated, 379 were cultivated by owners and 147 by tenants. In the Tule Lake division there were 321 farms, of which 296 were operated by owners and 25 by tenants. No difficulty has been experienced in getting settlers for lands in the Tule Lake division and on the 68 farm units containing 4,752 acres of irrigable land, opened October 16, 1931, under Public Order No. 28, there were 185 qualified applicants, a few of whom showed assets in excess of \$10,000 each; the majority, however, had \$3,000 to \$6,000 worth of property, most of which was in equipment and stock.

In 1932 crop yields were about average, but net returns were unsatisfactory, as prices for all farm commodities were the lowest in years. Alfalfa hay sold for as low as \$3.50 per ton during the winter, but jumped to \$10 late in the spring of 1933, after all had been sold. Fat steers sold for 3½ cents, while hogs sold for as low as 1½ cents. With these low prices prevailing, farmers found it impossible to meet their obligations. However, owing to the recent rise in the market prices of farm products and the general upward trend of business conditions, there is now a feeling of optimism among the farmers.

On the enlargement of the first 9 miles of the J Canal, excavation was completed from station 0 to station 445 + 40, 7 bridges were rebuilt, and 38 minor structures modified to meet the requirements of the enlarged canal section.

OWYHEE PROJECT, OREGON-IDAHO

During the fiscal year ending June 30, 1933, the project was brought from 58 percent to about 63 percent completion.

The General Construction Co. contract for the Owyhee Dam was completed in October 1932, 4 months ahead of schedule. Grouting of the contraction joints is to be done by the Government when the heat in the mass concrete has been lowered to mean annual temperature, probably in the spring of 1934. Gates in the dam were closed December 8, 1932, and 150,000 acre-feet of water stored before the release of Owyhee Ditch water began lowering the reservoir.

Work on the inlet end of Tunnel No. 1 was concluded in December, 1932, but clean-up of camp and plant was deferred until award of contract for the controlling works. The lining of the inlet, construction of portal, trash rack, and controlling works was awarded to Connolly in December 1932, and concreting begun immediately. By the end of the fiscal year the work was completed and ready for final payment. The outlet end of Tunnel No. 1 was practically finished in May 1932, 16 months ahead of schedule, and the clean-up around the portal of Tunnel No. 5 was done in 1933, the lining having been finished in February 1932, 20 months ahead of stipulated time.

Construction of the North Canal to station 242+20 and structures was carried on during the fiscal year, the contract being completed in April 1933, on time. The contract for the open cut, stations 29+45 to 36+35, was finished in September 1932, and the lining of Tunnel No. 3 and the approach tunnel to Owyhee River siphon in October, 7 months ahead of schedule.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

Economic conditions were noticeably improved during the fiscal year, largely as a result of better prices received for commodities and the favorable crops produced in 1932. The wool clip of 1933 brought 25 cents per pound as compared to 10 cents the previous year, and the bonus on sugar beets amounted to 55 cents per ton in addition to the regular payment of \$5 per ton received late in 1932. Butterfat doubled in price, moving up from 10 to 20 cents per pound. Wheat reached a low of 19 cents per bushel in 1932, but was quoted locally at 73 cents at the close of the fiscal year.

The 1932 crops were valued at \$601,121, the lowest since 1924, but the decrease resulted entirely from low unit values, since yields in nearly all cases were considerably above the previous year. Sugar beets averaged 11¼ tons per acre, while many growers reported 16 tons per acre or better and the total value of the crop reached \$325,000, which was more than all other crops combined. Corn, oats, and barley, the principal feed grains, yielded 600,000 bushels, or nearly three times the production of these grains for 1931.

A contract between the United States and the Belle Fourche Irrigation District was executed May 2, 1933, under which a small pumping plant, costing \$6,500, is to be constructed for supplementing the water supply of the Johnson lateral, a canal dependent on direct flow. Work began June 14 and the plant was about 75 percent completed at the end of the month.

SALT LAKE BASIN PROJECT, UTAH

Weber River division.—The use of storage water during 1932 from the newly constructed Echo Reservoir increased the gross value of all crops at least 25 to 30 percent. This is the first year that a full

water supply has been available for the division during the entire irrigation season. The storage water has proved to be particularly valuable for late season use where the main crops are sugar beets, fruits, vegetables, berries, and alfalfa. It has also made possible the growing of more of the intensified crops and less wheat and other grains. The lands of the division are mostly in small ownerships. A large percentage of the farmers live on their farms. The remainder live in the adjoining towns and cities. Along with the growing of crops, dairying and stock raising are important industries.

The division is well supplied by a large number of fruit and vegetable canning factories, several fruit-packing plants, 3 sugar factories, 3 or 4 creameries, and 1 meat-packing and by-products plant. Most of these factories and plants operated during 1932, although business in many cases was below normal. In the case of the sugar factories, however, the number of tons of sugar beets received was larger than for the preceding 5 or 6 years. The receipts from the sale of such crops as sugar beets, fruits, and vegetables resulted in a good economic condition being maintained in the farming districts. As far as known no farms were abandoned during the year and mortgage foreclosures were limited to a very few.

The value of farm crops varied from \$2 per acre for poor pasture to \$137 per acre for asparagus and grapes. The average crop value for the division was \$29.11 per acre. There was an increase in the acreage of higher-priced crops due to the availability of storage water.

STRAWBERRY VALLEY PROJECT, UTAH

The project members, as a whole, are experiencing the most acute water shortage since the project was first utilized in 1918. The effect upon crops is, of course, adverse, and in many cases settlers are being forced to abandon a portion of their planted crops in order that water be reserved for late irrigations to mature the balance. Alfalfa-hay production is materially less than the production of 1932, and sugar-beet tonnage will not reach the 1932 production figure, even in view of the 1933 increase in acreage planted.

In view of the almost constant and steady decrease in the average number of acre-feet of water delivered under the project since completion in 1918, it is very important that water be conserved to a most stringent degree.

The first step along that line resulted from the interchange contract with the Utah Power & Light Co., completed July 18, 1931, for the intersale of electrical energy. Such connection provides a complete breakdown service, furnishes an outlet for surplus power generated, and entirely eliminates the practice of drawing water from reservoir storage for the single purpose of power generation during consumption peaks. The second step in the direction of

improving the available water supply is the proposed cancelation of water-right contracts covering marginal and nonirrigable lands. This procedure, if carried out, will increase the water supply applicable to the remaining contracts in force.

OKANOGAN PROJECT, WASHINGTON

The population of the project remains practically unchanged. There was a small decline in the irrigated acreage during the past year, comprising unfit areas and orchards that had suffered permanent injury through drought. Approximately 90 percent of the project farmers have negotiated for loans to carry on their season's operations during 1933, either through the Intermediate Credit Bank or the Regional Agricultural Credit Corporation. The return for the 1932 apple crop was very poor and the Government loan agencies have preserved the solvency of the district. The project is assured of the largest supply of gravity water since 1921.

Approximately \$6,000 was spent during the fall of 1932 and spring of 1933 in concrete lining of the main canal, where seepage loss was excessive. Two thousand two hundred and fifty linear feet of canal were lined with 3 inches of concrete which involved the placing of 386 cubic yards. Six old wooden weirs were replaced with concrete. Future plans call for installation of about 10 miles of 4- to 12-inch pipe line to replace lines in poor condition, and elimination, wherever possible, of high checks in order to conserve water.

YAKIMA PROJECT, WASHINGTON

Sunnyside and Tieton Divisions.—There were 86,639 acres irrigated in 1932 on the Sunnyside division, comprising 3,403 farms, or 24 more than for the previous year, of which 2,163 were operated by owners and 1,240 by tenants. Total values of crops declined 28 percent from the previous year under the handicap of low prices. Alfalfa continued the principal crop in area and total value. Although distressingly low in price, dairy and poultry products proved to be the stabilizing factors.

The irrigated acreage on the Tieton division increased to 26,100 acres, a gain of 1 percent, although the number of farms declined further from 1,330 to 1,320, of which 84 percent were operated by owners. Apples remained the principal crop in both acreage and total value. The acreage in bearing orchard increased from 17,402 to 10,002 acres, or 9 percent. The returns on fruits, comprising 71 percent of the gross area cropped, amounted to \$775,536, representing a decline of 63 percent from the 1931 valuation.

At the beginning of the 1933 season unpaid operation and maintenance charges for 1931 on the Sunnyside and Tieton divisions were 57 and 64 percent, respectively, of the totals. A large pro-

portion of the delinquent payments were finally made, so that practically all lands previously cultivated were receiving water at the close of the fiscal year. Funds for this purpose have been secured from Government loan agencies by direct application and also through various fruit organizations. In order to assist them in raising funds to meet their operation and maintenance payments, water users were given employment on operation and maintenance work to the greatest possible extent.

In addition to the regular operation and maintenance work on the two divisions, including removal of silt and repair and replacement of canal and lateral structures, a small program of betterments was continued on the Tieton division. Improvement consisted of replacement of three steel flumes with concrete lining and pipe lines, involving 409 linear feet of 46-inch redwood stave pipe, 480 linear feet of 30-inch reinforced concrete pipe, and 400 linear feet of reinforced concrete canal lining. Studies were made and preliminary plans and estimates prepared for increasing the water supply for this division.

Kittitas Division.—Water was delivered in the spring of 1933 to 50,442 acres of irrigable land lying under the Main, North Branch, and South Branch Canals of the Kittitas Division. This water was delivered to 71 landowners under the Main Canal, 120 under the South Branch Canal, and 440 under the North Branch Canal, all of whom have signed for water deliveries with the Kittitas Reclamation District. The Bureau of Reclamation is operating the project during the calendar year 1933, under appropriate contract, for the Kittitas Reclamation District, the entire cost of operation being paid in advance by the district. The Northern Pacific Railway Co. and its subsidiary, the Northwestern Improvement Co. have sold, at the appraised valuation, all but 300 acres of their irrigable lands. On March 4, 1933, there were 47 farm units opened to entry and 88 applications had been received to June 30, 38 of whom made entry. Three were pending action of the examining board and 47 had either been rejected or declined to accept the farm units offered. Seven hundred and fifty inquiries were received concerning the 47 tracts opened and the 26 other units to be opened later. There are on file in the project office approximately 500 names of inquirers to whom will be sent the new order opening the 26 tracts later in the year.

Kennewick Division.—The Kennewick Irrigation District continued the operation of its pumping plant, serving, however, only about 2,600 acres of a total of 4,000 acres. Under existing economic conditions, settlement of the additional area is expected to be slow. Development is further retarded on account of the necessity for removing many of the apple orchards and replanting to other crops, such as soft fruits, berries, asparagus, etc., to which the district is

better adapted. The district is requesting a more favorable contract for purchase of power to lighten the annual charges for a few years in order to encourage settlement. The construction of the power canal and 4,200-horsepower hydroelectric power plant at Prosser was completed on August 31, 1932. The diversion works are located at the Prosser Dam, which was acquired under the terms of a contract with the Kennewick Irrigation District. The canal is about 2.4 miles in length and has a designed capacity of 1,100 second-feet.

Storage division.—Satisfactory progress was made on the construction of the dam for the Cle Elum Reservoir by the contractors. At the close of the fiscal year the work was about 94 percent finished and the time 73 percent elapsed. The embankment, which was the principal feature of the work, was practically completed at the close of the year. The stilling basin for the combined outlet for spillway and tunnel was completed before winter. Storage capacity for about 150,000 acre-feet was provided for the season of 1933 under the control of two emergency butterfly gates. A capacity of 360,000 acre-feet will be available in 1934. The full capacity of 435,000 acre-feet will require the installation of the spillway gates.

RIVERTON PROJECT, WYOMING

The season of 1933 showed a satisfactory increase over 1932 in the number of settlers and in the area under cultivation. Most marked is the increase in area of excellent stands of alfalfa. There is also a substantial increase in the number of cattle and sheep on the project. Although the settlers have little money, they are all improving their farms. They owe little and face the future with confidence. The maintenance work has been done almost exclusively by settlers, a policy which has assisted them in paying irrigation assessments. The water-rental charge for the current year has been paid for all land previously irrigated and the books show no delinquent water charges. A considerable number of new settlers is already assured for 1934.

SHOSHONE PROJECT, WYOMING

The project water supply was ample and production was about on a par with former years. The prices received have steadily declined so that the returns for the 1932 crops showed a decrease of 25 to 30 percent from those of the previous year. The average per acre gross returns ranged from \$12.09 on the Garland division to \$4.48 on the Willwood. Shipments of agricultural products totaled 1,373 carloads compared to 1,651 the previous year, and livestock shipments were 107 cars compared to 91. At the close of the year quotations on nearly all crops and livestock had made decided advances and while the farmers had little left to sell, the outlook for 1933 was decidedly more optimistic.

New construction was limited to the Willwood division and consisted of 2.91 miles of lateral extensions, 1.04 miles of open drain, and 1.59 miles of tile drain with the necessary structures. Temporary transmission lines, 5.25 miles in length, were required. A large flume on the Willwood main canal was damaged by unstable foundation conditions. This was repaired by lowering some of the piers, extending the length of the flume 25 feet, and building a new concrete inlet and head wall.

At the Shoshone Dam and power plant one of the 48-inch emergency valves in the line leading to the power house was broken and this required installation of a new shell. One of the two power pipes leading through the base of the dam was thoroughly cleaned and painted. New trash racks were installed at the inlet of each pipe. The 58-inch balanced irrigation valves were repaired by electric welding where cavitation had occurred on the valve bodies and throat liners. The concrete lining in the outlet tunnels leading from these valves was also repaired.

SECONDARY INVESTIGATIONS

Funds for the investigation of prospective projects and kindred work are derived from appropriations by Congress, from contributions by States and other organizations for expenditures by the Bureau of Reclamation, and by direct payment by States and other organizations to personnel operating under the direction of or in cooperation with the Bureau. Additional data became available for the use of the Bureau as the result of work by other agencies wholly independent of the Bureau's activities, involving the expenditures of large amounts which are not reported to the Bureau. Federal funds for work done during the past fiscal year as hereinafter described were available from the acts of March 26, 1930; May 14, 1930; July 3, 1930; February 14, 1931; March 4, 1931; April 22, 1932; and March 4, 1933. Of \$160,370.57 disbursed by the Bureau during the past fiscal year, including \$77,033.83 for work under section 15 of the Boulder Canyon Project Act, \$143,733.81 was provided by the United States.

CALIFORNIA

All-American Canal investigations.—Prior to April 1933, a small amount of preliminary investigations was carried forward in assembling available data on silt carried by the Colorado River at the Imperial Dam site and minor consideration was given to methods for its disposal.

In April 1933 following the availability of \$25,000 from the Second Deficiency Appropriation Act for the fiscal year 1933, silt studies and investigations were outlined involving determination of present silt load at Laguna Dam and efficiency of Yuma project desilting works,

silt inflow from washes between Parker and Imperial Dam sites, character and extent of river bed deposits which are likely to be eroded from the stream channel between the Parker and Imperial Dam sites, stream cross-section and silt content for various Colorado River discharges at Imperial Dam site, and the best cross-section for the All-American Canal to prevent excessive scour or fill. Field work on these investigations was well under way at the close of the fiscal year.

On June 9, 1933, a contract was executed with the Imperial Irrigation District providing for investigations, surveys, estimates, and preparation of plans and specifications covering the construction of that portion of the proposed All-American Canal from Pilot Knob through the sand hills. The contract contemplates maximum expenditures of \$20,000 all to be advanced by the district.

Sacramento-San Joaquin investigations.—Data were assembled and field and office studies continued on plans for an initial development to relieve present distressed conditions in the upper San Joaquin Valley. Volume I, which is a general description of the results of investigations and reports made by the State of California on initial and ultimate developments for the Great Central Valley and in particular the Upper San Joaquin River, was prepared and authorized for release. Volume II, which covers work done by the Bureau of Reclamation on plans for an emergency project for the relief of the Upper San Joaquin Valley, is in the course of preparation.

For use in connection with the Bureau report on an emergency project, preliminary designs and estimates were prepared for a reservoir of 400,000 acre-feet capacity at the Friant site on San Joaquin River, a reservoir of 355,000 acre-feet capacity at Folsom on American River, including power plants at each site, the San Joaquin-Kern County Canal with initial capacity of 3,000 c.f.s. and length of 120 miles from Friant Reservoir to Tulare-Kern County line, Madera Canal with capacity of 1,500 c.f.s. and length of 20 miles from Friant Reservoir to Fresno River, and Sacramento-San Joaquin cross-cut channel with a cross-sectional area of 3,000 square feet and a length of 9 miles along Snodgrass Slough from the Sacramento River to Mokelumne River.

IDAHO

Crane Creek project.—A preliminary examination was made during September 1932 of the works and lands comprising this project to determine the desirability of conducting investigations looking to the rehabilitation of the Washington County Irrigation District. Some repairs are needed at the Crane Creek storage dam, the canal and distribution system would need to be reconstructed, and a short feed canal would need to be built from Little Weiser River to Crane Creek to augment the water supply for the reservoir. The lands would need to be reclassified to determine the economic feasibility of rehabili-

tating the project. With unavoidably high construction and operating costs, threatening project feasibility, and in view of the lack of funds for construction in case the project should prove to be feasible, it was concluded that detailed investigations were not justified.

Twin Falls—Oakley project.—The Oakley project is located in Goose Creek Valley, a tributary of Snake River, in Cassia County, Idaho.

The project works, consisting of a reservoir with a capacity of 74,000 acre-feet and a canal system to irrigate 40,000 acres, were constructed during the period 1909 to 1913 by the Twin Falls-Oakley Land & Water Co. Water supply proved inadequate for the 40,000 acres proposed for irrigation and much reduction in area has taken place. The construction company became insolvent.

Upper Snake River storage investigations.—Reconnaissance surveys were made of the watershed of Henrys Fork and its tributaries and of the canyon section above Alpine, Wyo., of the South Fork of Snake River to locate possible reservoir and dam sites. Much of this region is inaccessible and aerial pictures were secured with the cooperation of Army fliers to facilitate the investigations. A geological examination was made of the possible sites and the more promising ones were surveyed in detail. A preliminary geological report covering 14 of the reservoir sites examined was prepared in January 1933.

Reservoir topography was taken at the following reservoir sites: Shotgun Creek site on Henrys Fork; Boone Creek, Squirrel Meadows, and Wyoming Creek sites, on tributaries of Fall River; and Trail Creek and Teton Creek sites on tributaries of Teton River. Dam-site topography was taken as follows: Teton Canyon site on Teton River; Mountain Ash, Bechler Meadows, Grassy Lakes, Lake of Woods, and Canyon Creek sites on Fall River tributaries; and Dry Creek and Station Creek sites on South Fork of Snake River.

Location surveys were made for reservoir feeder canals as follows: From Cascade Creek to Grassy Lakes site, Bechler River to Wyoming Creek site, Squirrel Creek to Squirrel Meadows site, and Fall River to Boone Creek site. A canal line was also located from Henrys Fork to serve canals diverting from Fall and Teton Rivers. Reconnaissance surveys were made to determine the possibilities of transmountain diversion from adjacent watersheds to the Henrys Lake drainage basin.

Further work on these investigations has been suspended pending receipt of funds from local interests to pay one half of the costs after January 1, 1933, in accordance with the provisions of the law.

NEVADA

Humboldt River investigations.—A total of 144,000 acres are irrigated from Humboldt River and its tributaries, exclusive of Little Humboldt River, which is no longer connected with the main stream.

Investigations were undertaken to determine the feasibility of improving the present deficient water supply. An inspection was made of known reservoir sites, such as the North Fork, Devils Gate, South Fork, Upper Maggie Creek, Lower Maggie Creek, Rock Creek, and Oreana, for which maps are available. Topographic surveys and geological investigations were made of the Imlay, Callahan, and Rye Patch Dam and Reservoir sites on Humboldt River near Imlay. Argenta Swamp was investigated with a view of draining the swamp and improving channel conditions in that vicinity to conserve water wastefully evaporated.

OREGON

Grants Pass Irrigation District.—A brief inspection, with report dated September 24, 1924, was made of the Grants Pass Irrigation District to determine the advisability of conducting investigations on reconstruction and extension of project works and the paying ability of the district.

The district is largely devoted to suburban type of agriculture with holdings averaging 5 acres. Irrigation growth have been small but steady and now amounts to 6,500 acres. The distribution system is adequate for the present area, but may eventually need improvement by concrete lining of canals or pipe lines to reduce water losses to a minimum. Operation and maintenance costs are high on account of power purchased for pumping, necessity of delivering water to small holdings, and repairs to the canal system occasioned by floods and slides along the steep side hills on which they are located. The future agriculture of the project is uncertain and additional investigations are not warranted at this time.

Brogan project investigations.—The Brogan project was built in 1910 and consists of two reservoirs on tributaries of Willow Creek and a canal system to serve about 20,000 acres. The water supply from Willow Creek has been disappointing and the irrigated area has shrunk to about 2,000 acres, in part dependent for water on pumping from deep wells at a high cost. A preliminary water-supply study has been made to determine the surplus water available from Burnt River and as soon as the investigations are authorized an engineer will be assigned to investigate the feasibility of developing and bringing such waters into the the Willow Creek watershed.

Baker secondary project.—A reservoir is desired on Powder River to supplement the supply for about 25,000 acres of developed lands at Baker, the supply usually failing about July 1. The Oregon Legislature, together with individuals and counties of the interested area, has arranged for an advance of \$8,500 to pay one half the cost of the requested investigation, but a start thereon awaits decision by the Comptroller General as to availability of Federal funds.

UTAH

Cache Valley project.—On January 3, 1933, a petition was filed with the Cache County Commissioners for the organization of the Wellsville-Mendon Conservation District to furnish water for lands not already included in an irrigation district or served by a canal company. After the usual legal procedure prescribed by the laws of Utah, on June 5, 1933, the district was organized by a practically unanimous vote and a board of directors was selected to act officially for the district in negotiations for the formation of the water users' association which will contract with the United States for construction of project works and of which the district will be a stockholder. The favorable vote was due largely to a careful delineation of district boundaries to include only landowners desirous of project water as determined by canvass.

Ogden River division.—A report on these investigations was completed in August 1932. The report covers a lower-valley development and an upper-valley development, both with water from Ogden River.

The lower-valley development contemplates the construction of an earth and rock-fill dam just below Huntsville on Ogden River to form a reservoir with a capacity of 38,000 acre-feet; relocation of highways around the reservoir; reconstruction and enlargement to a capacity of 280 c.f.s. of 4½ miles of pipe line of the Utah Power & Light Co. from the Huntsville Dam site to the mouth of Ogden Canyon; construction of the south Ogden High Line Canal, with an initial capacity of 35 c.f.s., from the mouth of Ogden Canyon to a point south of Ogden City, a distance of 8 miles; and construction of north Ogden High Line Canal, with an initial capacity of 120 c.f.s., from the mouth of Ogden Canyon to Brigham City, a distance of 23 miles. The cost of this development is estimated as \$2,693,000. The project would furnish 6,000 acre-feet of storage annually to Ogden City for municipal purposes, provide a supplemental supply for 14,700 acres of irrigated lands, and furnish a full irrigation supply for 4,520 acres of new lands. The irrigated area as a whole is highly developed and well colonized, but is seriously handicapped by lack of an adequate water supply, except where water is obtained by pumping at high cost. Where a full water supply is available, crop returns are higher than on most irrigation projects, and it is concluded that the project is feasible if constructed with interest-free funds.

The upper-valley development contemplates the construction of a rock-fill dam with concrete-slab face at the Magpie site on South Fork of Ogden River to form a reservoir with 14,000 acre-feet of capacity at an estimated cost of \$1,907,000. It would provide 8,000 acre-feet of storage for Ogden City and furnish a supplemental supply to 6,000 acres of irrigated lands in the upper Ogden Valley. Assuming that the lands irrigated would pay only for the additional cost of

obtaining 14,000 acre-feet of capacity instead of 8,000 acre-feet at this site, the cost to irrigation interest under this project would be \$322,000, which amount could be repaid by the lands benefited.

Utah Lake investigations.—These investigations are being conducted to determine the feasibility of increasing the water yield of Utah Lake by diking off Provo Bay and Goshen Bay and conserving water lost by evaporation from these areas. During August and September 1932 field tests were made along the line of the proposed Goshen Bay dike to determine the character of foundation and construction materials. Twenty-three borings were made at intervals of 1,000 to 1,300 feet across Utah Lake and 2 borings were made several miles south of the dike line and 1 boring near the middle of Utah Lake. The material was found to be a fine clay. Eight bearing tests were made of the material in place. Data were assembled on past dredging operations at the north end of Utah Lake and on dikes constructed in Great Salt Lake with similar foundation conditions.

Sanpete division.—Investigations were continued on plans for transmountain diversions of Colorado River Basin waters for lands in Sanpete County, with particular attention to the present and future water requirements of lands along Cottonwood Creek, Huntington Creek, and Price River.

Field tests were made to determine the character and extent of embankment material for the proposed Gooseberry Dam. Designs and estimates were prepared for various heights of dam at the Gooseberry site to aid in selecting a project plan for the Gooseberry unit.

Ouray Valley project.—A reconnaissance was made of the Ouray Valley project to determine the general feasibility of a plan for diverting waters from Duchesne River to lands which are now partially irrigated by means of a long canal diverting from the Uintah River. Inadequate stream flow records preclude an immediate conclusive report on project possibilities.

WASHINGTON

Columbia Basin project investigations.—Preliminary studies were made in the Denver office to determine the feasibility of a 2-stage development, contemplating the construction of a low dam and power plant at the Grand Coulee site, with a view of later enlargement, when conditions warrant, to that ultimately required for the complete Columbia Basin project development.

A report dated May 24, 1933, presented an estimate of \$59,235,000 for a dam of the multiple-arch type producing a head of 150 feet and a power plant of 8 units with an electrical capacity of 65,000 kilowatts, together with transformer and switching equipment. The general design for this development was arranged to permit the dam to be

raised to the ultimate head of 353 feet without interfering with power production. Financial studies of this development based on an interest rate of 4 percent indicate that such a step development is at least as desirable as the plan for initial construction to the ultimate height, interest savings offsetting increased construction investment occasioned by increased quantities and an interrupted construction program. With long delays in ultimate development, net investment is materially reduced through intervening repayment of initial construction costs.

Roza Division—Yakima project.—A report dated September 1932, presents a plan and estimate for this division and was prepared after a full review of alternative plans for the production of power needed for pumping water to almost one half of the total area of the division, including one of a power canal through Moxee Valley solely for power production, this plan being discarded in favor of enlargement of the main canal of the division to the lower end of the tunnel piercing the Yakima Ridge. The main canal with a total length of 99 miles will have an initial capacity of 2,165 second-feet of which 1,200 second-feet would be for irrigation purposes and 965 second-feet for power purposes, power water being carried for a distance of 12 miles where it would be returned to the Yakima River at Yakima with a power head of 140 feet.

The principal construction features of the canal are the diversion dam, a low concrete dam surmounted by drum gates, a tunnel 9,700 feet long through Yakima Ridge between East Selah and Moxee Valleys, and a tunnel 5,000 feet long through Rattlesnake Ridge near Union Gap.

The division comprises 72,000 acres of irrigable land, of which nearly 10,000 acres lie in Selah and Moxee Valleys near Yakima, with the remainder lying in a strip averaging $2\frac{1}{2}$ miles wide along the north valley slope from Wapato to Benton City, a distance of 50 miles. The lands are located well above the river bottoms, generally of superior soil and topography requiring little artificial drainage and adapted to the growing of fruit and general crops. They were classified as to irrigability in 1927. The construction cost is estimated at \$18,161,000, of which \$934,000 would be allocated to commercial power, leaving a net irrigation cost of \$239 per acre, including power production and pumping facilities. The estimates reflect construction conditions as of 1930 and under conditions prevailing in the past fiscal year the cost would be somewhat less. Expenditures have already been made to the extent of \$2,800,000, principally for storage, the needs of this division being taken care of along with other divisions of the Yakima project in the construction of the completed reservoirs.

WYOMING

North Platte River power investigations.—Preliminary designs and estimates were prepared for a dam and power plant at the Kortess site on North Platte River. A geological map was prepared of the Northgate dam site and preliminary water-supply studies were made to determine the operation and utilization of the Northgate reservoir site. A profile was prepared of the North Platte River from the head of the Northgate reservoir site in Colorado to Casper, Wyo.

Further progress on these investigations has been delayed, pending the outcome of negotiations between the States of Colorado, Wyoming, and Nebraska on the division of waters from the North Platte River. Proposals by Colorado interests to divert a part of North Platte River flows to Cache la Poudre River in the vicinity of Cameron Pass, will, if carried out, materially affect the plans for power development in Wyoming.

COLORADO RIVER BASIN INVESTIGATIONS UNDER SECTION 15 OF BOULDER CANYON PROJECT ACT

Work was continued along the general lines followed in the previous fiscal year, in the main being directed to an inventory of irrigation resources, with an average working force of 35.

Arizona.—Topography and other appurtenant data were secured on a canal line from the Parker Dam site to the Gila River Valley for a study of the relative feasibility of irrigating the Gila Valley by diversion at Parker and by pumping from the proposed Imperial Dam which will be constructed to deliver water to the All-American Canal. It is expected that the final results will show the pumping plan to be preferable. A land classification was made of the Colorado River Indian Reservation (Parker Valley) under difficult conditions because of heavy brush and the lack of passable roads or trails.

Colorado.—In the latter part of the year a survey party was engaged upon investigation of possible reservoir sites, and particularly sites which had not been covered by private surveys on the Little Snake River and its tributaries in the Yampa River drainage area. Consideration is also being given to feasible canal routes to serve the lands on the divide between Little Snake and Yampa Rivers.

Nevada.—Field surveys were completed on possibilities of irrigating with waters from the Boulder Canyon Reservoir of lands lying adjacent thereto within practicable pumping lifts, including classification of such lands.

New Mexico.—Land-classification surveys were initiated in 1932 and continued throughout the fiscal year on lands lying to the south of the San Juan River and principally within the Navajo Indian

Reservation to determine the areas that might be irrigated by diversions from the San Juan River. Some consideration was also being given to the possibilities of diverting waters of the tributaries of San Juan River to the Rio Grande drainage area, such plan if carried out to be largely in lieu of irrigation of lands in New Mexico with San Juan River waters.

Utah.—Surveys were completed of possible reservoir sites to utilize the surplus waters of the Paria and Virgin Rivers and of Kanab Creek in southern Utah, and land classifications were made of irrigable areas reclaimable with such waters and particularly areas to be served with Virgin River waters in the vicinity of St. George, Utah, and Littlefield, Ariz. In connection with investigations of transmountain diversions from tributaries of the Price and San Rafael Rivers to the drainage area of the San Pitch River, investigations were made of the irrigability of lands that could be served by these tributaries of the Colorado River in the vicinity of Price and Castle Gate, Utah.

Wyoming.—Classification of the irrigable area in the Green River Basin of Wyoming was continued through the year except as such work was suspended during the winter. Investigations were also conducted on reservoir sites to conserve flood and winter flows now escaping in the Green and Blacks Fork Rivers. Test pits were dug at the dam site for a reservoir on Green River immediately below Kendall, Wyo.

TABLES

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1933*

DEBIT SIDE		
Construction account:		
Primary projects:		
Cost of irrigation works:		
Original construction.....	\$202, 180, 218. 35	
Supplemental construction.....	12, 547, 586. 70	
Value of works taken over.....	2, 056, 939. 90	
Total construction cost.....		\$216, 784, 744. 95
Operation and maintenance prior to public notice (net).....	2, 788, 382. 94	
Operation and maintenance deficits and arrearages funded with construction.....	5, 134, 986. 93	
Penalties on water-right charges funded with construction.....	1, 422, 862. 17	
		9, 346, 232. 04
		226, 130, 976. 99
Less (income items):		
Construction revenues.....	6, 468, 235. 89	
Contributed funds.....	1, 733, 552. 76	
Nonreimbursable appropriation (Rio Grande Dam).....	1, 000, 000. 00	
		9, 201, 788. 65
		216, 929, 188. 34
Less:		
Abandoned works, nonreimbursable cost, and charge-offs....	15, 613, 098. 50	
Balance payable.....		\$201, 316, 089. 84
Yuma auxiliary project:		
Cost of irrigation works.....	899, 837. 00	
Impounded funds, economy acts.....	241. 57	
		900, 078. 57
Less: Construction revenues.....		1, 605. 47
		898, 473. 10
Palo Verde Valley flood protection:		
Cost of reconstruction and repairs.....		30, 017. 34
Secondary projects and general investigations:		
Cost of surveys and investigations.....	2, 913, 257. 54	
Less: Contributed funds.....	544, 323. 14	
		2, 368, 934. 40
General offices' expense undistributed.....		16, 396. 30
Plant and equipment.....		503, 072. 57
Materials and supplies.....		304, 510. 08
Accounts receivable:		
Current accounts due.....	1, 834, 894. 14	
Deferred accounts not due.....	153, 998, 392. 17	
		155, 833, 286. 31
Undistributed clearing cost accounts.....		17, 786. 36
Unadjusted debits: Disbursement vouchers in transit.....		1, 586. 71
Cash:		
Balance on hand:		
Reclamation fund.....	2, 775, 970. 40	
Yuma auxiliary fund.....	155, 657. 79	
Special funds.....	116, 558. 61	
		3, 048, 186. 80
In special deposit and in transit.....		18, 600. 86
		3, 066, 787. 66
Total debits.....		364, 298, 575. 35

CREDIT SIDE

Security for repayment of cost of irrigation works:		
Contracted construction repayments.....	\$197, 475, 636. 77	
Yuma auxiliary contracted repayments.....	605, 679. 08	
		\$198, 081, 315. 85
Current accounts payable.....		438, 254. 32
Deferred and contingent obligations.....		831, 204. 78
Reserves and undistributed profits.....		7, 139, 482. 86
Operation and maintenance results, surplus.....		708, 109. 72
Unadjusted credits: Collection vouchers in transit.....		621. 11

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1933—*
Continued

Government aid for reclamation of arid lands:		
Reclamation fund.....		\$155,898,434.83
Special funds:		
Increase of compensation.....		2,797,960.33
Rio Grande Dam.....		1,000,000.00
Wind River Indian (Riverton).....		359,176.04
Judgments, United States courts.....		602,814.38
Drainage and cut-over lands.....		99,815.08
General investigations, 1923-Dec. 31, 1924.....		266,352.66
Arid, semiarid, swamp, and cut-over timberlands.....		35,923.75
Columbia Basin irrigation project.....		11,634.28
Colorado River levee system.....		447,321.01
Palo Verde Valley flood protection.....		49,599.09
		161,569,031.45
Advances to reclamation fund:		
Treasury loan (act of June 25, 1910).....	\$20,000,000.00	
Less: Amount repaid.....	10,000,000.00	
	10,000,000.00	
Treasury loan (act of Mar. 4, 1931).....	5,000,000.00	
		15,000,000.00
		176,569,031.45
Less: Nonreimbursable appropriation, Rio Grande Dam.....		1,000,000.00
		175,569,031.45
Less: Impairment of funds:		
Abandoned works.....	1,348,044.64	
Nonreimbursable construction cost.....	721,636.25	
Operation and maintenance cost uncollectible.....	453,272.39	
Charge-offs, act of May 25, 1926.....	14,639,947.96	
Washington office cost since Dec. 5, 1924.....	1,196,546.52	
Attendance at meetings, cost.....	1,815.90	
Giving information to settlers.....	1,900.70	
Prepaid Civil Service retirement fund.....	2,340.33	
		18,365,504.69
		157,203,526.76
Less: Impounded funds, economy acts, reclamation fund.....		103,940.05
		\$157,099,586.71
Total credits.....		364,298,575.35

¹ Contra.RECLAMATION TABLE 2.—*Available funds, expenditures, and balances, fiscal year 1933*

Items	Funds			
	Reclamation	Yuma auxiliary	Colorado River levee system	Palo Verde flood protection
Balance on hand, July 1, 1932.....	\$3,706,363.62	\$159,517.63	\$118,745.08	-----
Receipts:				
Proceeds from sale of public lands.....	293,863.78	-----	-----	-----
Proceeds from oil leasing act.....	1,833,721.00	-----	-----	-----
Proceeds from potassium royalties.....	8,692.03	-----	-----	-----
Proceeds from Federal power licenses.....	102,811.82	-----	-----	-----
From project collections.....	2,449,166.94	15,112.55	-----	\$212.94
From general treasury.....	-----	-----	50,000.00	50,000.00
Total.....	8,394,619.19	174,530.18	168,745.08	50,212.94
Expenditures:				
Disbursements.....	5,504,708.74	18,630.82	55,681.99	43,637.52
Impounded funds, act of June 30, 1932.....	103,940.05	241.57	2,678.99	400.91
Total.....	5,618,648.79	18,872.39	58,360.98	44,038.43
Balance on hand June 30, 1933.....	2,775,970.40	155,657.79	110,384.10	6,174.51

RECLAMATION TABLE 3.—*Accretions to reclamation fund, by States*

States	Sale of public lands		Proceeds from oil leasing act		Potassium royalties and rentals ¹	Total to June 30, 1933
	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933		
Alabama.....			\$92,852.85	\$164,545.01		\$164,545.01
Arizona.....	\$36,395.24	\$2,614,351.21	106.68	159.86		2,614,511.07
California.....	40,585.21	8,080,237.01	790,715.61	9,455,013.88	\$99,966.37	17,635,217.26
Colorado.....	24,773.34	10,208,245.15	28,796.60	430,868.49		10,639,113.64
Idaho.....	6,095.71	6,970,930.71	449.47	12,266.64		6,983,197.35
Kansas.....		1,032,764.48				1,032,764.48
Louisiana.....			2,955.41	27,571.16		27,571.16
Montana.....	27,585.12	15,251,462.91	32,073.28	1,027,479.58		16,278,942.49
Nebraska.....	19.02	2,095,386.57				2,095,386.57
Nevada.....	7,772.09	1,023,146.53	126.00	4,859.37		1,028,005.90
New Mexico.....	60,978.46	6,492,991.96	72,342.30	335,931.97		6,828,923.93
North Dakota.....	² 2,638.71	12,216,644.76	19,156.75	108,398.05		12,325,042.81
Oklahoma.....	507.12	5,927,178.02				5,927,178.02
Oregon.....	13,035.12	11,940,230.62		10.25		11,940,240.87
South Dakota.....	384.19	7,724,475.80	261.69	1,147.55		7,725,623.35
Utah.....	23,443.28	4,198,395.26	44,989.92	354,774.28		4,553,169.54
Washington.....	2,485.85	7,436,697.15	5,677.97	28,011.88		7,464,709.03
Wyoming.....	52,442.74	8,468,998.63	743,216.47	31,696,758.46		40,165,757.09
Total.....	293,863.78	111,682,136.77	1,833,721.00	43,647,796.43	99,966.37	155,429,899.57
Proceeds, Federal water power licenses.....						³ 468,535.26
Grand total.....						155,898,434.83

¹ Proceeds for fiscal year, \$8,692.03.² Contra.³ Proceeds for fiscal year, \$102,811.82.

RECLAMATION TABLE 4.—Consolidated statement by projects, of construction cost of irrigation works, other items reimbursable with construction, and amounts to be repaid by water users

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance deficits and arrearages, and penalties		Construction revenues, contributed funds, and nonreimbursable appropriation (contra)		Abandoned works, nonreimbursable cost, and authorized charge-offs ¹	Total to be repaid by water users	
	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933		Fiscal year 1933	To June 30, 1933
Arizona: Salt River.....		\$12,744,222.59		\$115,983.50					\$382,097.31		\$10,166,021.97
Arizona-California: Yuma.....	\$2,117.88	9,376,730.71	2 227.28	373,528.37		\$31,886.52	225,842.11			\$24,714.87	9,556,303.49
California: Orland.....		2,399,302.93		2 11,432.99	709.71	709.71	28,403.88			505.71	2,360,175.77
Colorado:											
Grand Valley.....	154,365.13	5,015,342.42		138,621.28			268,692.83	812,374.64		51,865.13	4,072,896.23
Uncompangre.....		6,422,627.88		311,103.02		186,197.53	24,238.72	1,260,791.93		2 1,039.60	5,634,897.78
Idaho:											
Boise.....	7,790.04	10,010,350.03		422,283.48		879,515.76	33,831.48	82,393.84	2 22,204.91		16,773,079.32
King Hill.....		1,905,918.80				110,122.51	28,187.27	497,464.06			1,490,389.98
Minidoka.....	70,395.14	15,017,209.32	2 230.36	320,543.15		506,729.58	270,412.25	2,085,754.93	2 2,288.15	2 195,307.63	13,776,438.97
Minidoka-Gooding.....	101,308.94	4,122,387.92				56,414.17	853.69	2,172.58			4,176,629.51
Kansas: Garden City.....		342,963.68		52,898.10				334,474.96			
Montana:											
Bitter Root.....	80,000.00	627,641.05								80,000.00	627,641.05
Huntley.....		1,562,302.99		2 1,000.16		387,974.62	18,371.91	62,049.83		3,393.13	1,868,855.71
Milk River.....	16,246.76	6,844,118.15		437,255.58		100,393.62	218,620.66	74,193.81	1,732,021.45	236,280.60	5,575,552.09
Sun River.....	40,149.71	7,384,002.31	2 82.47	133,133.75	414.18	102,918.34	47,399.69	89,214.47		40,481.42	7,483,440.24
Montana-North Dakota: Lower Yellowstone.....	26,181.56	3,685,403.14	2 363.78	2 3,758.80		905,716.50	2 1,254.00	53,532.47		2 5,291.34	4,151,604.37
Nebraska-Wyoming: North Platte.....	21,522.99	19,229,964.68		743,294.42	2 352.74	1,506,545.46	2 593.79	497,901.52		18,576.46	20,981,903.04
Nevada: Newlands.....	4.51	7,956,907.07		2 2,155.44		34,631.20	52,347.53	4,437,820.00		2 4.51	3,499,215.30
New Mexico:											
Carlsbad.....		1,464,649.87		2 17,751.77		4,831.89	29,058.79	374,883.58	2 372,014.82	1,047,787.62	
Hondo.....		339,491.68		32,952.01			656.03	371,787.66			
New Mexico-Texas: Rio Grande.....	71,197.53	15,076,073.39		2 297,857.81		10,000.00	1,408,881.64	326,900.97		61,197.53	13,042,432.97
North Dakota:											
Burford-Trenton.....		223,423.06		2 31.75				221,423.69			
Williston.....		517,630.09		2 165.00			1,930.00	420,358.33			
Oregon:											
Baker.....	1,101.67	281,591.64					5,003.00			1,101.67	276,588.64
Umatilla.....		5,137,937.20				230,428.32	1,957.13	86,321.24		2 1,734.15	4,394,703.46
Vale.....	71,705.00	3,479,380.62	8,574.07	30,397.21		1,125.00	6,125.00	79,154.07		329,843.70	3,503,662.83
Oregon-California: Klamath.....	90,089.03	6,227,451.61	1,576.98	81,576.54	490.67	74,971.13	237,687.02	7,499.72		3,600,744.51	6,160,546.32
Oregon-Idaho: Owyhee.....	1,360,757.87	11,237,640.06					13.36	4,367.97		1,360,744.51	11,233,272.09
South Dakota: Belle Fourche.....	10,595.92	4,519,270.69		2 1,989.03		669,943.43	7,030.00	379,031.58		3,505.92	4,782,042.57

RECLAMATION TABLE 4.—Consolidated statement by projects, of construction cost of irrigation works, other items reimbursable with construction, and amounts to be repaid by water users—Continued

State and project		Construction cost		Operation and main- tenance before pub- lic notice (net)		Operation and main- tenance deficits and arrearages, and penalties		Construction revenues, contributed funds, and nonreimburs- able appropriation (contra)		Abandoned works, non- reimburs- able cost, and authorized charge-offs ¹		Total to be repaid by water users	
Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933	Fiscal year 1933	To June 30, 1933
Utah:													
Salt Lake Basin.....	\$87,494.49	\$2,912,781.44										\$87,469.49	\$2,866,900.34
Strawberry Valley.....		3,507,423.49		\$10,744.06		\$513.26	\$82,753.38	\$25.00	\$45,881.10		258,379.12	513.26	3,342,541.81
Washington:													
Okanogan.....	400.00	1,452,129.45		247,766.87			25,194.37		6,630.78	\$998,727.20			424,198.97
Yakima.....	1,089,356.14	17,063,614.76		264,357.08		18,329.10	101,431.18	2,607.18	386,181.77	4,214.60		1,105,078.06	16,710,292.49
Yakima-Kittitas.....	198,724.90	8,799,345.11				7,356.50	16,434.47		4,431.07			205,804.40	8,811,048.51
Wyoming:													
Riverton.....	4,659.46	3,888,656.50				16,984.12	75,373.49	958.25	18,566.43			20,685.33	3,945,463.56
Shoshone.....	14,242.09	10,008,828.62		\$4,212.16		3,366.07	467,031.92	4,969.24	383,957.16	1,544,685.71		16,851.08	8,579,572.84
Total.....	3,488,034.62	216,784,744.95	13,459,352.78	88,382.94	134,803.36	6,557,849.10	186,438.73	9,201,788.65	15,613,098.50	3,276,868.57	201,316,089.84		
1 Abandoned works:													
Garden City.....					\$334,474.96								\$62,049.83
Hondo.....					371,787.66								1,732,021.45
Bluff-Trenton.....					221,423.69								89,214.47
Williston.....					420,358.33								382,254.00
													4,437,820.00
					1,348,044.64								374,883.58
													326,900.97
													888,340.82
													7,499.72
													379,031.58
													998,727.20
													4,214.60
													1,544,685.71
													13,882,956.55
Nonreimbursable cost: Salt River.....													
Authorized charge-offs, act of May 25, 1926:													
Grand Valley.....													
Uncompahgre.....													
Boise.....													
King Hill.....													
Minidoka.....													

¹ Contra.

RECLAMATION TABLE 5.—Consolidated statement, by projects, of operation and maintenance cost operation and maintenance returns, and other credits, and results, calendar year 1932

State and project	Cost	Operation and maintenance returns				Other credits ¹	Results: Excess (+) or deficit (—)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous reve- nues		
Arizona: Yuma auxiliary.....	\$20,246.35	\$25,797.60			\$1,103.70		+\$6,654.95
Arizona-California: Yuma.....	194,703.26	228,726.25	\$389.40	\$311.06	10,275.24		+44,376.57
California: Orland.....	35,104.51	38,928.78	576.62	65.21	280.15		+4,555.83
Colorado:							
Grand Valley.....	31,803.14	33,750.00			688.00		+2,634.86
Uncompahgre.....	1,366.29	² 188,762.22	² 302.64		42.32	\$168,544.54	-21,844.29
Idaho:							
Boise.....	8,161.44	9,570.82					+1,409.38
Mindoka.....	70,174.84	61,951.19			9,038.97		+815.32
Mindoka-Gooding.....	44,534.44				12,532.06	10,140.23	-21,862.15
Montana:							
Huntley.....		² 3,018.11				2,965.05	-53.06
Milk River.....	9,969.58	48,164.41			194.82		+8,389.65
Sun River.....	2,400.00	² 509.39				115.00	+224.39
Montana-North Dakota: Lower Yellowstone.....	671.66	982.04				4,171.30	+4,391.68
Nebraska-Wyoming: North Platte.....	21,573.55	19,760.54	² 46.14		2,476.58	813.28	+1,430.71
Nevada: Newlands.....		² 14,214.15				12,214.15	-2,000.00
New Mexico: Carlsbad.....	40,237.52		76.79	308.17	1,493.05		-38,975.85
New Mexico-Texas: Rio Grande.....	281,841.91	267,625.37	9,689.32		4,527.22		-520.06
Oregon: Umatilla.....	3,111.86	² 588.93			2.87		+3,667.40
Oregon-California: Klamath.....	95,936.66	² 3,466.92	2.13		41,614.40	61,454.45	-680.16
South Dakota: Belle Fourche.....	66,687.08	63,700.00			2,326.92		
Washington:							
Yakima.....	218,366.55	250,522.41	6,160.24	1,909.42	6,085.23	² 29.53	+42,462.38
Yakima-Kittitas.....	76,487.19	79,653.82	² .27			² 1,988.31	-578.05
Wyoming:							
Riverton.....	19,564.51					16,984.12	
Shoshone.....	² 669.02	² 360.02			2,580.39		-309.00
Total.....	1,275,761.36	926,530.17	16,545.45	2,593.86	95,261.92	275,384.28	+35,366.60

¹ Amounts to be repaid with construction and charge-offs under act of May 25, 1926 (44 Stat., 636)² Contra.

RECLAMATION TABLE 6.—Consolidated statement, by projects, of operation and maintenance cost, operation and maintenance returns and other credits, and results to Dec. 31, 1932

State and project	Cost	Operation and maintenance returns					Other credits		Results, excess (+) or deficit (-)
		Charges contracted	Penalties	Discounts (contra)	Miscellaneous revenues	Deficits uncollectible	Amounts to be repaid with construction		
Arizona: Yuma auxiliary-----	\$352,382.46	\$420,422.64	\$537.74	\$1,106.79	\$9,430.19			+\$76,901.32	
Arizona-California: Yuma-----	4,874,199.48	4,866,616.48	99,827.77	59,153.22	207,358.26		\$2,921.96	+243,371.77	
California: Orland-----	530,719.30	565,252.27	2,780.61	21,736.09	3,711.73			+19,286.22	
Colorado:									
Grand Valley-----	224,283.21	240,500.00			3,450.00			+19,666.79	
Uncompangre-----	1,191,521.60	1,009,582.18	10,934.23	11,602.77	24,503.88		168,544.54	+10,440.46	
Idaho:									
Boise-----	2,822,903.56	2,134,398.59	69,769.20	52,649.72	111,044.96		601,070.37	+40,729.84	
King Hill-----	156,734.25	60,711.27		1,519.05	342.89		97,199.14		
Minidoka-----	2,393,288.10	1,928,190.51	29,463.35	22,341.74	136,821.93		266,497.42	+5,373.37	
Minidoka-Gooding-----	67,283.16	1,844.43			12,891.51		10,140.23	-42,406.99	
Montana:									
Huntley-----	1,014,941.03	554,787.34	15,712.18	10,449.84	11,886.91	1 \$81,354.00	361,950.44	+37,756.32	
Milk River-----	317,232.88	250,605.12		1,662.25	5,652.71		100,393.62	-268.14	
Sun River-----	321,676.88	164,100.32	6,360.24	3,408.33	29,626.27	1 34,148.00	90,642.24		
Montana-North Dakota: Lower Yellowstone-----	1,349,676.18	348,205.57	2.59	4.63	135,751.13		865,631.52		
Nebraska-Wyoming: North Platte-----	2,825,479.91	1,859,663.76	27,257.89	35,811.80	36,065.01		1,043,899.25	+105,594.20	
Nevada: Newlands-----	1,453,490.54	1,174,581.57	28,660.62	24,970.08	26,012.61	1 211,292.00	28,060.60	-9,823.22	
New Mexico: Carlsbad-----	952,829.73	874,468.99	30,312.69	17,459.07	27,639.88		1,934.00	-35,933.24	
New Mexico-Texas: Rio Grande-----	3,736,167.53	3,650,340.14	20,408.97	4,486.44	69,904.86				
North Dakota:									
Buford-Trenton-----	74,781.07	2,317.41			10.00	2 72,453.66			
Williston-----	904,662.04	34,042.75	45.81		489,754.75	2 380,818.73			
Oregon: Umatilla-----	698,042.52	379,147.64	7,697.84	3,314.38	39,870.63	1 91,083.35	197,132.52	+13,575.08	
Oregon-California: Klamath-----	1,380,414.07	1,172,203.92	3,623.28	4,942.27	200,559.77		65,166.48	+56,197.11	
South Dakota: Belle Fourche-----	1,679,975.32	948,508.18	29,196.35	9,240.72	31,919.80	1 119,606.00	570,194.90	+10,209.19	
Utah: Strawberry Valley-----	437,856.39	376,880.88	10,196.17	11,858.67	20,400.30		42,237.71		
Washington:									
Okanogan-----	649,647.22	371,441.72	1,451.15	397.47	70,485.39	1 181,472.06	25,194.37		
Yakima-----	4,865,716.54	4,697,456.66	97,621.65	59,365.15	143,199.05		74,822.75	+87,918.42	
Yakima-Kittitas-----	157,269.93	153,040.63					6,795.66	+2,566.36	
Wyoming:									
Riverfront-----	87,352.14				11,978.65		75,373.49		
Shoshone-----	918,603.16	546,235.71	13,614.85	11,051.05	41,392.57	1 38,036.00	371,095.48	+80,720.40	
Total-----	36,379,100.20	28,785,636.68	505,375.18	368,591.53	1,901,365.64	1,210,263.80	5,066,928.69	+721,878.26	

2 Projects abandoned.

1 Charge offs under act of May 25, 1926 (44 Stat. 636).

RECLAMATION TABLE 7.—*Accounts receivable, construction water-right charges (including contributed funds)*

State and project	Due		Collected			Uncollected June 30, 1933
	Fiscal year 1933	To June 30, 1933	Cash		Other credits to June 30, 1933	
			Fiscal year 1933	To June 30, 1933		
Arizona:						
Salt River.....	\$152,490.32	\$7,268,705.72	-----	\$7,116,215.41	-----	\$152,490.32
Yuma auxiliary.....	3,183.53	594,941.50	\$962.85	588,866.51	\$1,584.05	4,490.94
Arizona-California: Yuma.....	43,780.94	3,912,486.55	74,230.97	3,421,372.34	477,622.34	13,491.87
California: Orland.....	¹ 9,935.83	824,128.75	19,588.90	782,897.71	-----	41,231.04
Colorado:						
Grand Valley.....	67,938.05	356,868.50	87,500.00	290,229.94	66,638.56	-----
Uncompahgre.....	90,180.95	580,397.16	¹ 103.44	427,247.72	62,865.05	90,284.39
Idaho:						
Boise.....	¹ 23,418.46	4,018,105.88	24,261.64	3,990,635.67	27,193.29	276.92
King Hill.....	16,000.00	82,825.66	-----	8,025.66	-----	74,800.00
Minidoka.....	85,889.28	8,360,028.04	37,491.92	7,740,749.38	547,565.83	71,712.83
Minidoka-Gooding.....	-----	280,798.48	-----	280,798.48	-----	-----
Montana:						
Huntley.....	6,450.01	557,681.67	5,062.66	467,005.12	90,538.16	138.39
Milk River.....	42,437.84	49,332.76	-----	3,002.76	-----	46,330.00
Sun River.....	3,705.76	207,952.54	3,550.98	204,493.59	3,045.55	413.40
Montana-North Dakota: Lower Yellowstone.....	510.36	288,862.89	510.36	288,862.89	-----	-----
Nebraska-Wyoming: North Platte.....	351,070.76	3,704,030.71	34,846.84	2,793,843.75	854,177.36	56,018.60
Nevada: Newlands.....	14,907.71	1,147,305.36	14,972.84	1,086,990.76	55,965.98	4,348.62
New Mexico: Carlsbad.....	¹ 104,913.04	891,349.52	¹ 3,865.06	891,070.65	81.25	197.62
New Mexico-Texas: Rio Grande.....	42,138.87	3,536,896.20	10,000.00	3,151,777.81	311,671.64	73,446.75
Oregon:						
Baker.....	-----	5,000.00	-----	5,000.00	-----	-----
Umatilla.....	22,128.51	538,515.79	625.13	398,191.14	5,190.89	135,133.76
Vale.....	-----	5,000.00	-----	5,000.00	-----	-----
Oregon-California: Klamath.....	21,183.44	1,117,704.21	37,316.58	1,111,540.43	1,624.84	4,538.94
Oregon-Idaho: Owyhee.....	-----	4,354.61	-----	4,354.61	-----	-----
South Dakota: Belle Fourche.....	7,667.49	630,051.20	6,500.00	552,575.54	77,475.66	-----
Utah:						
Salt Lake Basin.....	-----	44,756.77	-----	44,756.77	-----	-----
Strawberry Valley.....	¹ 6,344.67	1,313,961.47	49,719.35	1,298,990.08	9,165.00	5,806.39
Washington:						
Okanogan.....	10,425.94	162,069.27	425.94	133,798.04	-----	28,271.23
Yakima.....	¹ 101,439.03	6,908,418.67	33,349.08	6,586,209.68	36,363.75	285,845.24
Yakima-Kittitas.....	-----	1,000.00	-----	1,000.00	-----	-----
Wyoming: Shoshone.....	¹ 4,814.51	827,491.91	¹ 4,229.63	820,802.90	6,490.18	198.83
Total.....	731,224.22	48,221,030.80	432,717.91	44,496,305.34	² 2,635,259.38	1,089,466.08
Paid in advance of due dates.....	-----	-----	27,163.43	412,403.79	³ 138,344.49	-----
Refunds.....	-----	-----	-----	98,591.20	3,212.84	-----
Total collections.....	-----	-----	459,881.34	45,007,300.33	-----	-----

¹ Contra.² Other credits for fiscal year, \$481,723.62.³ Decrease for fiscal year, \$53,663.18.

RECLAMATION TABLE 8.—Accounts receivable, operation and maintenance charges (after public notice)

State and project	Due		Collected			Uncollected June 30, 1933
	Fiscal year 1933	To June 30, 1933	Cash		Other credits to June 30, 1933	
			Fiscal year 1933	To June 30, 1933		
Arizona: Yuma auxiliary.....	\$18,426.28	\$435,149.08	\$15,903.58	\$409,140.60	\$13,359.25	\$12,649.23
Airzona-California: Yuma.....	130,166.05	3,570,951.22	126,385.76	3,375,370.68	176,550.38	19,030.16
California: Orland.....	38,682.38	565,003.77	30,159.82	510,544.96	22,416.03	32,042.78
Colorado:						
Grand Valley.....	24,115.14	264,615.14	28,630.03	258,130.03		6,485.11
Uncompahgre.....	¹ 10,398.49	1,008,683.69	¹ 10,398.49	977,809.79	30,873.90	
Idaho:						
Boise.....	8,832.86	2,148,942.91	14,210.42	2,095,959.29	52,649.72	333.90
King Hill.....		60,711.27		59,192.22	1,519.05	
Minidoka.....	47,003.19	1,975,111.22	29,051.03	1,866,467.93	108,025.26	618.03
Minidoka-Gooding.....	3,013.12	4,857.55	3,013.12	4,857.55		
Montana:						
Huntley.....		554,787.34		543,594.31	11,193.03	
Milk River.....	41,581.48	261,204.11	35,038.98	236,183.49	1,662.25	23,358.37
Sun River.....	2,359.39	166,500.32	2,092.57	161,966.28	4,352.22	181.82
Montana-North Dakota: Lower Yellowstone.....	429.71	339,952.99	429.71	339,948.36	4.63	
Nebraska - Wyoming: North Platte.....	14,737.43	1,875,380.40	11,831.35	1,803,909.44	62,087.90	9,383.06
Nevada: Newlands.....		1,174,581.57		1,135,901.55	38,680.02	
New Mexico: Carlsbad.....	¹ 85.68	874,383.31	74,448.04	857,381.00	16,872.71	129.60
New Mexico-Texas: Rio Grande. North Dakota:	249,084.35	3,537,970.82	290,015.45	3,226,254.22	218,416.54	93,300.06
Buford-Trenton.....		2,317.41		2,317.41		
Williston.....		34,042.75		34,042.75		
Oregon: Umatilla.....	2,726.74	379,285.45	4,410.78	370,551.55	7,253.96	1,479.94
Oregon-California: Klamath.....	55,350.92	1,192,161.96	55,755.88	1,157,914.97	30,536.22	3,710.77
South Dakota: Belle Fourche.....	56,767.01	1,005,275.19	56,767.01	995,899.20	9,375.99	
Utah: Strawberry Valley.....		376,880.88		365,022.21	11,858.67	
Washington:						
Okanogan.....		371,441.72		368,788.67	2,653.05	
Yakima.....	218,915.05	4,762,641.06	201,899.71	4,483,935.72	61,233.02	217,472.32
Yakima-Kittitas.....	118,212.02	212,415.63	82,587.02	176,790.63		35,625.00
Wyoming: Shoshone.....	2,566.02	548,801.73	2,556.24	524,050.93	23,705.43	1,045.37
Total.....	1,022,484.97	27,704,050.49	1,054,788.01	26,341,925.74	² 905,279.23	456,845.52
Paid in advance of due dates.....			¹ 17,344.54	18,037.48	16.53	
Penalties and interest.....			10,541.76	489,104.96	20,480.00	3,156.47
Refunds.....			10,869.68	36,550.16	156.09	
Total collections.....			1,058,854.91	26,885,618.34		

¹ Contra.² Other credits for fiscal year, \$92,453.88.

RECLAMATION TABLE 9.—Accounts receivable, rental of irrigation water

State and project	Due		Collected		Other credits to June 30, 1933	Uncollected June 30, 1933
	Fiscal year 1933	To June 30, 1933	Cash			
			Fiscal year 1933	To June 30, 1933		
Arizona:						
Salt River.....		\$2, 246, 726. 01		\$2, 246, 726. 01		
Yuma auxiliary.....	\$833. 70	10, 205. 19	\$626. 70	9, 998. 19		\$207. 00
Arizona-California: Yuma.....	7, 083. 68	526, 156. 66	7, 122. 93	512, 308. 00	\$12, 654. 19	1, 194. 47
California: Orland.....		121, 437. 30		121, 437. 30		
Colorado:						
Grand Valley.....	10, 897. 60	490, 119. 08	8, 646. 38	480, 467. 19	6, 500. 67	3, 151. 22
Uncompahgre.....	1, 968. 77	1, 221, 188. 08	405. 16	1, 218, 087. 51		3, 100. 57
Idaho:						
Boise.....	8, 050. 00	781, 888. 57	8, 050. 00	777, 168. 07	4, 720. 50	
Minidoka.....	26, 199. 84	556, 440. 79	36, 674. 84	553, 064. 28	3, 351. 51	25. 00
Minidoka-Gooding.....	13, 796. 00	13, 796. 00	4, 935. 33	4, 935. 33		8, 860. 67
Montana:						
Huntley.....	454. 41	10, 706. 42	454. 41	10, 706. 42		
Milk River.....	1 441. 52	237, 319. 57	672. 83	226, 972. 79	1, 208. 14	9, 138. 64
Sun River.....	82. 47	132, 187. 56	295. 00	129, 388. 16	1, 366. 62	1, 432. 78
Montana-North Dakota: Lower Yellowstone.....	363. 78	135, 051. 08	354. 60	135, 041. 90		9. 18
Nebraska-Wyoming: North Platte.....	1, 612. 75	341, 528. 79	1, 612. 75	341, 509. 79	10. 00	9. 00
Nevada: Newlands.....		28, 291. 16		22, 114. 31	6, 176. 85	
New Mexico:						
Carlsbad.....	348. 99	39, 424. 83	380. 85	39, 407. 58		17. 25
Hondo.....		9, 129. 70		9, 129. 70		
New Mexico-Texas: Rio Grande.....	13, 813. 60	1, 452, 601. 01	15, 356. 30	1, 434, 929. 51		17, 671. 50
North Dakota:						
Buford-Trenton.....		31. 75		31. 75		
Williston.....		2, 117. 28		2, 117. 28		
Oregon:						
Umatilla.....	1, 774. 00	94, 902. 82	1, 774. 00	68, 626. 02		26, 276. 80
Vale.....	9, 488. 75	21, 037. 17	6, 084. 89	16, 107. 21		4, 929. 96
Oregon-California: Klamath.....	29, 201. 43	270, 528. 59	26, 302. 90	264, 234. 23	25. 00	6, 269. 36
South Dakota: Belle Fourche.....	349. 66	9, 054. 48	349. 66	9, 036. 68	17. 80	
Utah: Strawberry Valley.....		17, 596. 13		17, 596. 13		
Washington:						
Okanogan.....		110, 645. 28		108, 061. 09	2, 584. 19	
Yakima.....	2, 167. 78	178, 757. 53	1, 885. 93	168, 832. 23		9, 925. 30
Wyoming:						
Riverton.....	4, 792. 56	16, 293. 49	4, 285. 91	13, 739. 42	2, 544. 32	9. 75
Shoshone.....	5, 750. 83	69, 189. 60	5, 716. 41	68, 062. 83	275. 09	851. 68
Total.....	110, 961. 88	9, 144, 351. 92	131, 987. 78	9, 009, 836. 91	41, 434. 88	93, 080. 13

¹ Contra.² Other credits for fiscal year, \$642.72

RECLAMATION TABLE 10.—*Irrigation and crop results on Government reclamation projects, 1932* ¹

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts				
	Irrigable acreage ²	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Arizona: Salt River.....	245,658	242,110	224,444	\$9,680,555	\$43.04	94,000	39,500	39,500	\$775,000	\$19.65
Arizona-California: Yuma.....	65,055	47,042	44,204	1,402,615	31.73	200	186	174	20,348	117.28
Yuma division.....	49,278	38,603	36,250	1,103,078	30.43					
Reservation division (Indian).....	7,765	2,991	2,945	43,108	14.64					
Bard division (White).....	6,026	4,188	3,995	84,649	21.19					
Yuma auxiliary (Mesa).....	1,986	1,280	1,014	171,780	169.36	200	186	174	20,348	117.28
California: Orland.....	20,704	14,059	13,017	318,064	24.43					
Colorado: Grand Valley.....	30,384	15,660	14,978	243,611	16.26	18,400	13,900	13,500	228,200	16.90
Uncompahgre.....	75,654	59,700	59,666	706,272	11.84	1,650	1,550	1,545	18,540	12.00
Idaho: Boise.....	172,303	156,341	148,669	1,614,182	10.86	143,950	133,048	128,748	1,355,400	10.50
New York Irrigation District.....	17,612	15,762	15,244	125,497	8.23					
Nampa-Meridian Irrigation District.....	39,943	36,774	33,653	398,087	11.17					
Boise-Kuna Irrigation District.....	48,351	45,115	43,556	434,522	9.98					
Wilder Irrigation District.....	57,740	50,816	46,613	572,280	12.28					
Big Bend Irrigation District.....	1,783	1,417	1,327	14,193	10.70					
Black Canyon Irrigation District.....	6,457	6,042	6,276	69,643	11.10					
King Hill.....	8,000	7,042	6,834	69,070	10.10					
Minidoka.....	120,941	107,583	99,913	1,444,575	14.46	727,951	645,271	621,762	7,328,620	11.80
Minidoka Irrigation District.....	72,022	62,350	57,552	793,575	13.79					
Burley Irrigation District.....	48,919	45,233	42,361	631,000	15.37					
Montana: Bitter Root Irrigation District ³	18,240	15,825	15,023	206,486	13.74					
Butte.....	32,540	23,880	23,880	502,825	21.08					
Milk River.....	134,557	46,224	46,020	588,972	12.80					
Malta division.....	56,652	16,915	16,761	210,874	12.58					
Glasgow division.....	22,133	5,639	5,579	33,698	6.04					
Chinook division.....	55,772	23,680	23,680	344,400	14.54					
Sun River.....	55,064	36,064	43,915	202,688	5.18					
Fort Shaw division.....	9,370	7,321	7,410	57,433	7.75					
Greenfields and Big Coulee divisions.....	45,714	28,733	43,715	145,265	4.58					
Montana-North Dakota: Lower Yellowstone.....	45,891	31,235	31,235	669,455	21.43					
District No. 1.....	31,307	21,781	21,781	475,112	21.81					
District No. 2.....	14,584	9,454	9,454	194,343	20.56					

RECLAMATION TABLE 10.—Irrigation and crop results on Government reclamation projects, 1932—Continued

State and project	Lands on projects covered by crop census				Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts	
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		
				Total		Per acre
Nebraska-Wyoming:						
North Platte.....	234,956	188,516	185,998	2,969,359	15.96	16.79
Pathfinder Irrigation District.....	112,368	88,642	87,985	1,143,133	12.99	
Gering and Fort Laramie Irrigation District.....	54,876	51,385	49,524	1,090,669	22.02	
Goshen Irrigation District.....	51,642	35,034	35,034	625,075	17.84	
Northport Irrigation District.....	16,170	13,455	13,455	110,382	8.21	
Nevada: Newlands.....	87,800	81,927	49,730	510,168	10.25	
New Mexico: Carlsbad.....	25,055	24,761	22,515	441,017	19.59	
New Mexico-Texas:						
Rio Grande.....	155,000	137,449	134,531	3,539,326	26.30	14.18
Elephant Butte Irrigation District.....	88,000	79,302	77,618	1,986,082	25.60	
Rincon Valley.....	16,000	12,463	12,322	205,361	16.67	
Mesilla Valley.....	72,000	66,839	65,296	1,781,321	27.28	
El Paso County Water Improvement District No. 1.....	67,000	58,147	56,913	1,552,644	27.28	
Mesilla Valley.....	56,000	48,277	47,273	1,280,102	27.06	
El Paso Valley.....	11,000	9,870	9,640	272,642	28.27	
Oregon:						
Baker.....	\$ 6,521	5,598	5,598	53,521	9.56	
Umatilla.....	14,053	10,838	10,500	134,086	12.82	14.00
East division.....	7,878	6,904	6,579	87,842	13.35	
West division.....	6,175	3,934	3,921	46,844	11.94	
Vale.....	15,384	4,915	3,608	34,016	9.43	14.00
Oregon-California:						
Klamath.....	61,334	50,060	49,027	812,175	16.56	11.60
Main division.....	41,122	32,293	31,940	524,302	16.40	
Tule Lake division.....	20,212	17,767	17,087	287,873	16.85	
South Dakota: Belle Fourche.....	57,112	35,000	\$ 49,129	601,121	12.24	
Utah:						
Salt Lake Basin.....	40,930	38,906	37,232	646,050	17.35	29.11
Strawberry Valley.....	18,633	17,704	16,823	209,184	12.43	21.93
High Line division.....	13,798	7,930	7,579	255,908	20.72	
Spanish Fork division.....	8,499	7,930	7,830	180,958	19.56	
Springville-Mapleton division.....						

	6,000	3,564	3,196	242,905	76.01	166,717	125,131	125,131	3,639,700	29.50
Washington:										
Okanogan.....	204,437	152,852	140,497	3,032,381	21.58					
Yakima.....	102,460	86,639	78,882	1,827,912	23.17					
Sunnyside division.....	22,977	26,100	22,900	775,536	33.87					
Tieton division.....	72,000	40,093	38,715	428,933	11.08					
Kititas division.....										
Wyoming:										
Shoshone.....	73,581	45,204	45,204	500,202	11.06					
Garland division.....	41,649	31,552	31,552	381,527	12.09					
Frankie division.....	20,063	9,715	9,715	101,031	10.39					
Willwood division.....	11,869	3,937	3,937	17,644	4.48					
Riverton.....	32,000	2,809	2,547	19,455	7.64					
Total with irrigation.....	2,039,074	1,555,144	1,506,320	31,165,752	20.69	1,512,405	1,214,461	1,196,400	18,627,219	15.57
<i>Cropped without irrigation</i>										
Milk River.....			9,999	\$35,869	\$3.59					
Malta division.....			5,680	18,164	3.20					
Glasgow division.....			4,319	17,705	4.10					
Sun River.....			1,694	5,792	3.42					
Fort Shaw division.....			126	611	4.84					
Greenfields and Big Coulee divisions.....			1,568	5,181	3.30					
Lower Yellowstone.....			5,541	14,520	2.62					
District No. 1.....			3,331	9,037	2.56					
District No. 2.....			2,010	5,483	2.73					
Klamath.....			55,326	309,229	5.58					
Total cropped without irrigation.....			72,560	365,410	5.03					
Grand totals.....	2,039,074	1,555,144	1,578,880	31,531,162	20.00	1,512,405	1,214,461	1,196,400	\$18,627,219	\$15.57
Grand totals of projects proper and Warren Act.....	3,551,479	2,769,605	2,775,280	50,158,381	18.00					

Data are for calendar year (irrigation season), except on Salt River Project, where data are for corresponding "agricultural year" October 1931 to September 1932.

² Areas for which Bureau was prepared to supply water in 1932.

³ Bitter Root Irrigation District being rehabilitated by United States under act of July 3, 1930.

4 Includes some dry-farmed tracts irrespective of the area given below, under "Cropped without irrigation."

⁵ Estimated.

⁶ Includes some dry-farmed tracts.

GENERAL LAND OFFICE

(FRED W. JOHNSON, Commissioner)

The work of the General Land Office originates through the administration of the public land laws enacted by Congress. Its volume depends upon the degree to which citizens, associations, other Federal agencies, and the States avail themselves of their legal rights, and is in no manner within the control of the office. The appropriations for the operating expenses of the Land Service were reduced from \$2,224,400 for the fiscal year 1932, to \$2,033,300 for the fiscal year 1933, and a corresponding decrease took place in personnel of from 641 to 583 employees. Notwithstanding these reductions the work of the office, which is constantly increasing in complexity, may, as a whole, be reported as current. During the fiscal year the total original public land entries, including those on Indian lands, fell to 3,117,781 acres from 4,551,774 acres the previous year. The acreage included in public land entries is not, however, an infallible yardstick with which to measure the work accomplished, for each year adds to the already intricate land system many new laws that further complicate the work; 71 public land laws were enacted during the second session of the Seventy-second Congress and first session of the Seventy-third Congress that affect the activities of the office.

Homestead entries continued to account for over 87 percent of the public lands appropriated. Nearly three fourths of the lands homesteaded during the year were in the four Rocky Mountain States of Montana (233,237 acres), Wyoming (678,777 acres), Colorado (254,228 acres), and New Mexico (721,579 acres). The geographic center of homestead entries remains, as for the past 10 years, in northwestern Colorado, but the geographic center of the vacant, unappropriated and unreserved public lands is 300 miles west on the Utah-Nevada boundary near Ely, Nev. There remained on June 30, 1933, 172,084,580 acres, exclusive of Alaska, of vacant, unappropriated and unreserved public lands.

In the annual report of the Commissioner of the General Land Office for the fiscal year ended June 30, 1930, attention was called to a number of uncontrolled fires in the coal beds on the public domain, particularly in Colorado, Montana, North and South Dakota, Utah, and Wyoming, which have been burning for years. Under authority of the Emergency Conservation Act, approved March 31, 1933 (Public No. 5, 73d Cong.), for the relief of unemployment through the performance of useful public work and for other purposes, a

camp was established in May to control a number of these coal fires in the Little Thunder Basin, Wyo. The superintendent and foremen were selected from those having years of experience in coal mining and kindred work in the coal fields of Wyoming, and at the close of the fiscal year the camp of 200 workmen was completely organized and work commenced on five separate and distinct fires.

Three important changes in organization took place during the year. In July 1932 the Public Survey Offices at Phoenix, Ariz.; Reno, Nev.; and Olympia, Wash., were reduced from operating and record offices to record offices only; in January 1933 four district land offices located at Little Rock, Ark.; Gainesville, Fla.; Cass Lake, Minn.; and Alliance, Nebr., were closed and the business transferred to the General Land Office, and in April 1933 the entire field service was transferred to and consolidated with the Division of Investigations in the Department of the Interior. In the following tabulation is presented a résumé of the acreage of public land disposed of during the year:

ORIGINAL ENTRIES

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising.....	4,752	2,297,931	132	60,300
Enlarged.....	473	120,739	17	2,861
Reclamation.....	59	5,623	14	1,512
Forest.....	60	5,546	2	200
Sec. 2289 et al.....	2,183	212,142	77	7,175
Total homesteads.....	7,527	2,641,981	242	72,048
Deserts.....	88	10,029	1	82
State selections.....	641	369,973		
Railroad selections.....	15	11,590		
Indian allotments.....	14	1,815		
Applications and filings.....	161		6	
Miscellaneous.....	47	10,261	2	2
Total.....	8,493	3,045,649	251	72,132
Indian land as above.....	251	72,132		
Grand total.....	8,744	3,117,781		

FINAL ENTRIES

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising.....	1,726	715,017	49	17,623
Enlarged.....	369	94,491	31	5,952
Reclamation.....	126	10,953	10	961
Forest.....	61	6,094	1	160
Commuted.....	21	1,751		
Sec. 2289 et al.....	784	80,023	65	5,364
Total homesteads.....	3,087	908,329	156	30,060
Deserts.....	91	12,199	1	244
Public auction.....	140	10,740	8	849
Timber and stone.....	22	2,093		
Mineral.....	115	8,603	1	44
Miscellaneous.....	213	4,625	70	2,370
Total.....	3,668	946,589	236	33,567
Indian land as above.....	236	33,567		
Grand total.....	3,904	980,156		

PATENTS AND CERTIFICATIONS

	Number	Acres
Homesteads:		
Stock raising.....	1,917	885,453
Enlarged.....	490	123,245
Reclamation.....	213	18,622
Forest.....	74	7,719
Commuted.....	37	3,352
Sec. 2289 et al.....	933	104,820
Total homesteads.....	3,664	1,143,211
Deserts.....	104	13,204
Public auction.....	152	12,321
Timber and stone.....	32	2,698
Mineral.....	194	18,596
Miscellaneous.....	4,958	563,829
Total patents.....	9,104	1,753,859
Certified to States.....		201,844
Grand total.....	9,104	1,955,703

LEASES AND PERMITS OUTSTANDING ON JUNE 30, 1933

	Leases		Prospecting permits	
	Number	Acres	Number	Acres
Oil and gas.....	802	258,063	4,443	7,382,506
Coal.....	421	81,033	270	228,867
Potash.....	13	30,745	212	455,612
Sodium.....	1	640	25	34,013
Phosphate.....	8	5,382		
Nonmineral, excluding grazing.....	74	162,475		
Total.....	1,319	538,338	4,950	8,100,998

RECEIPTS AND EXPENDITURES

Cash receipts.—The total cash receipts from sales, leases, and other disposition of public lands (including receipts from copies of records, sales of Government property, etc.) were \$3,812,208.11 and from proceeds of Indian lands \$47,222.86, an aggregate of \$3,859,430.97, all of which was deposited in the Treasury.

Receipts under Mineral Leasing Act.—Receipts of the Federal Government from bonuses, rentals, and royalties under the act of February 25, 1920, providing for the leasing of mineral rights on the public domain, aggregated \$3,256,440.19. The largest receipts were from mineral lands in California, the amount under this act being \$1,643,222.88. Wyoming came second with receipts totaling \$1,224,017.37. Receipts from the other States were: New Mexico, \$139,092.96; Utah, \$79,856.89; Montana, \$57,715.57; Colorado, \$53,400.04; North Dakota, \$33,515.65; Washington, \$9,537.22; Alabama, \$9,101.90; Louisiana, \$4,813.02; Idaho, \$1,225.44; South Dakota, \$498.05; Nevada, \$240; and Arizona, \$203.20. These figures do not include \$14,377.91 received as royalties in the State of Wyoming under the act of June 26, 1926, of which the State does not receive a share, nor \$7,834.28 received as royalties on coal leases in Alaska, of which the Territory receives no share. Under the provisions of the Mineral Leasing Act of February 25, 1920 (41 Stat. 437), the State receives 37½ percent of bonuses, rentals, and royalties thereunder from the public lands within its borders, the reclamation

fund receives 52½ percent, and the other 10 percent remains in the Treasury to the credit of miscellaneous receipts.

Distribution of receipts.—The aggregate receipts for the year, \$3,859,430.97, are distributed under the law approximately as follows: Reclamation fund, \$1,981,445.99; to the public-land States and certain counties within such States, \$1,328,585.59; general fund, \$502,176.53; and to the various Indian tribes \$47,222.86. Five percent of the net proceeds from cash sales of public land is paid to the public-land States within which such sales were made, and the balance of such net receipts from States named in the reclamation act is credited to the reclamation fund; 90 percent of the receipts under the mineral leasing act are divided between the States from which the minerals (principally oil) were taken and the reclamation fund; the receipts from sales of reclamation town sites and rentals and royalties from potash leases are credited to the reclamation fund; all of the receipts from sales of land and timber in the forfeited Oregon and California railroad grant will likely be paid to certain counties in Oregon in lieu of taxes that would be collected by the counties if the lands were in private ownership; 25 percent of the proceeds from land and timber in the Coos Bay wagon-road grant is paid to the counties from which the proceeds were derived; and the receipts from Indian lands, with the exception of 37½ percent of the royalties from the Red River oil lands in Oklahoma, which are paid to the State, are deposited in the Treasury to the credit of the various Indian tribes. All other moneys are deposited in the Treasury to the credit of the general fund.

The following table shows the distribution of these moneys insofar as is possible before final settlement of all accounts by the General Accounting Office:

Source of receipt	Distribution in the Treasury			
	General fund	Reclamation fund	State fund	Total
Sale of public land.....	\$30,287.14	\$73,526.16	\$4,501.83	\$108,315.13
Fees and commissions.....	58,325.84	196,567.91		254,893.75
Bonuses, rentals, and royalties from mineral leases.....	354,956.45	1,700,919.30	1,214,942.35	3,270,818.10
Proceeds of land and timber in Oregon and California railroad grant.....			107,490.20	² 107,490.20
Proceeds of land and timber in Coos Bay wagon-road grant.....	5,812.41		³ 1,651.21	7,463.62
Fees from copies of records.....	9,515.26			9,515.26
Royalties on coal leases in Alaska.....	7,834.28			7,834.28
Royalties and rentals from potash deposits.....		7,066.99		7,066.99
Power permits.....	15,347.95			15,347.95
Sale of reclamation town sites.....		3,365.63		3,365.63
Sale of standing timber in Alaska.....	6,326.73			6,326.73
Miscellaneous (surveying fees, rent of lands, forfeiture of contractors bonds, proceeds of Government property, etc.).....	13,770.47			13,770.47
Total.....	502,176.53	1,981,445.99	1,328,585.59	3,812,208.11
Sales and leases of Indian lands.....				⁴ 47,222.86
Aggregate.....				3,859,430.97

¹ First and fourth column contain \$14,377.91 royalties received in Wyoming under the act of June 26, 1926.

² This amount is payable to certain counties in Oregon in lieu of taxes.

³ Amount payable to Coos County, Oreg., 25 percent of proceeds of land and timber.

⁴ Of the amount received as royalties from oil lands in the bed of the Red River, Okla., 37½ percent, \$7,534.20, is paid to Oklahoma, and the balance, \$13,557.94, is credited to the Kiowa, Comanche, and Apache Indians.

Expenditures.—Total expenditures for the conduct of the business of the General Land Office, including expenses of the district land offices (\$226,491.08) amounted to \$1,781,164.20. Disbursements from deposits by individuals for surveys or resurveys (now carried under the title Expenses, public survey work, special fund), \$11,690.50, and from appropriations for surveying Indian reservations, \$28,224.82, are not included in above figures, either as receipts or expenditures.

REPAYMENTS

The act of June 16, 1880 (21 Stat. 287), and the act of March 26, 1908 (35 Stat. 48), as amended by the act of December 11, 1919 (41 Stat. 366), provide for the return of moneys received in connection with the disposal of public lands and covered into the United States Treasury. Repayment may be made to the land applicant or his heirs or assigns, where lands have been erroneously sold; where payments have been made in excess of lawful requirement; and where applications, entries, and proofs have been rejected, in the absence of fraud or attempted fraud. Under said laws there were stated 127 accounts, allowing repayment of \$17,596.18, and 84 claims were denied. The number of claims allowed includes 7 accounts granting repayment of \$6,848.19 received in connection with sales of Indian reservation lands and repaid from Indian trust funds.

FIELD SERVICE

The investigation forces of the Department of the Interior were consolidated into a single unit under a director of investigations, Mr. Louis R. Glavis, on April 27, 1933. This consolidation was to prevent duplication of work and to bring all investigational matters under the immediate supervision of the Secretary of the Interior both for economy and efficiency.

The appropriation for this service for the fiscal year 1933 was \$400,000. Of this sum \$60,000 was to be used for prevention and suppression of forest and other fires on the public lands, and for no other purpose, leaving the net sum of \$340,000, to which was added \$60,000 transferred from National Parks appropriation (roads and trails), making \$400,000 available for the prosecution of routine work.

Personnel.—The average number of active field investigators, exclusive of 6 special agents in charge of the divisional offices, was 69; average number of clerks in divisional offices, 20; total force employed, including special agents in charge, 95.

Collections and restorations.—Due to the activities of special agents, \$31,497.85 was collected and turned into the Treasury and 177,291.74 acres were restored to the public domain, representing fraudulent entries, etc., canceled on proceedings based on their reports.

Investigations.—On July 1, 1932, there were pending field investigation 11,006 cases. During the year 13,509 additional cases were received; 11,029 were investigated, reported and closed, leaving 11,552 pending investigation as against 11,006 the previous year. Of the 11,029 reports submitted, 4,075 were adverse and 6,954 favorable; 1,934 cases were closed without field investigation.

Action in courts.—On the recommendation of this Department 28 civil suits were brought by the Department of Justice. Cases tried numbered 35, of which 32 were won and 3 lost. As a result of the suits, \$13,678.90 were recovered and 6,644.28 acres were restored to the public domain. Offenses against the public land laws were responsible for 19 indictments. Of the criminal cases tried, three resulted in conviction and prison sentence was imposed in one case. Fines were imposed to the amount of \$2,775. The number admitted to practice before the Department for the fiscal year was 25.

Forest fires.—The appropriation for protecting public lands, timber, etc., 1933, included \$60,000 for prevention and suppression of forest and other fires on public lands, to be available for this and no other purpose, of which \$42,661.33 was spent.

CADASTRAL ENGINEERING SERVICE

Organization.—In order to keep within our greatly reduced appropriation for surveying the public lands it was necessary to curtail our program for surveys and resurveys in the field. The public survey offices at Phoenix, Ariz.; Reno, Nev.; and Olympia, Wash., had to be reduced in personnel early in the year and changed from field, operating, cartographic and record offices to record offices only. The permanent force of the service was reduced during the year by 20 employees, leaving a total of 122 at the close of the year.

Appropriations.—The regular appropriation for surveying public lands was \$500,000, to which was added \$75,000 by transfer from the National Park Service under the provisions of the Economy Act of June 30, 1932. Of the total amount, \$41,646.14 was impounded in the Treasury in accordance with the requirements of the Economy Act. In addition, moneys derived from the following appropriations and funds were received and used during the year:

	Receipts	Impounded	Expenditures
Surveying and allotting Indian reservations, 1933.....	\$19,645.00	\$1,367.30	\$18,210.72
Quieting title, Pueblo lands, New Mexico, 1933.....	11,337.83	988.22	10,014.10
Expenses, public-survey work, general.....	9,867.33	890.73	8,976.60
Expenses, public-survey work, Alaska.....	1,359.59	84.40	1,274.53
Total	42,209.75	3,330.65	38,475.95

Thus the total expenditure for surveying and associated work was \$521,829.81, against \$763,271.52 in the previous year.

Income (public moneys).—Funds collected by this service and deposited in the Treasury during the fiscal year 1933 consisted of the following:

Deposits by individuals for surveying public lands (R.S. 2334)-----	\$5, 734. 80
Miscellaneous receipts: Copies of records-----	2, 060. 00
Proceeds, sales of Government property-----	576. 00
Total-----	8, 370. 80

Summary of work.—Cadastral surveying projects were carried on in 21 States and the Territory of Alaska under 209 groups, of which 47 in 12 States were of resurveys. On such of the work as is measurable on a quantity basis, 19,364 linear miles were surveyed at an average cost of \$14.33 a mile, against \$18.32 in the previous year. In view of the reduced appropriation, the mileage accomplished is unusually large and the costs proportionately small, but increased mileage in the circumstances always means the curtailment of activities in that vast field of cadastral work where survey accomplishment cannot be gaged in terms of linear miles or area. Many important projects of this type and in the work as a whole were necessarily postponed until funds are available for their completion.

During the year just closed approximately 1,907,000 acres of agricultural lands in addition to the projects not measurable in area were surveyed in the United States proper and Alaska, the larger volumes being in the States of Arizona, California, Nevada, Idaho, and New Mexico. A total of 75,000 acres of nonagricultural and mineral lands were surveyed. In addition cooperative surveys were executed on the national forests, in connection with the boundaries of national parks and monuments, on leased coal and oil lands, and water power sites. Approximately 815,440 acres of lands were resurveyed in 14 States.

Indian surveys.—There was available \$19,645 for surveying and allotting Indian reservations during the fiscal year 1933. Consequently the work was confined to a limited number of important projects. The work included extension of the surveys already initiated on the Leech Lake Reservation, Minn.; the Cheyenne River, S.Dak.; and the Mescalero-Apache, N.Mex. Among the minor undertakings were the lowland survey on the Gila River Reservation, Ariz.; surveys on the Yuma Reservation along the abandoned channel of the Colorado River for use in an eviction suit instituted by the United States; resurveys in the vicinity of Barona ranch, California, to define the lands recently purchased by the United States and administered by the Indian Office; the survey of a tract of Cherokee Indian land on the Qualla Reservation, N.C.; and a special survey

on the Navajo Reservation, Ariz. A total of 131 tracts were surveyed on the Santa Clara Indian Pueblo, N.Mex., ranging in size from a fraction of an acre to over a hundred acres.

Office work.—Surveys and resurveys in 271 townships were platted and approved, 400 supplemental and segregation plats were constructed, exclusive of 38 supplemental plats accompanying survey returns, and the work of examining, platting and approving 72 mineral surveys, embracing 190 locations, at an average office cost of \$25.47 per location, was accomplished. There were also prepared 75 plats to accommodate tracts to which Indian title had been extinguished on the San Juan, San Ildefonso, and San Felipe Pueblos in New Mexico, and 30 plats of isolated tract surveys in Alaska. In addition the returns of 6 forest homestead entry and exchange surveys in the States were examined and approved and special maps of the Boulder Canyon Reservation were compiled.

Accepted surveys.—There were accepted and placed on file plats representing 1,222,777 acres of original surveys of public lands, and in addition 1,380,643 acres of lands resurveyed, comprising an aggregate area of 2,603,420 acres, against 2,366,313 acres in the previous year.

CARTOGRAPHIC ENGINEERING SERVICE

Map of the United States.—The copper plates for the map of the United States have been revised to show current changes and additions to the public-land surveys since the publication of the 1931 edition. New maps of Idaho and Oregon have been issued. The new maps of Arizona and Alaska are ready for printing. Recompilation of the map of Colorado is in progress. A large map, 11 by 14 feet, of the United States was made as part of the General Land Office exhibit at the Century of Progress Exposition at Chicago. Various maps were prepared for committees of Congress and on subjects of departmental interest. There were sold 7,574 photolithographic copies of township plats, for which \$3,787 was received, and 4,379 were furnished other departments for official use. There were mounted 1,857 maps and distributed 3,990 map publications and 228,411 circulars covering the various public-land laws and regulations.

HOMESTEADS AND ASSOCIATED ENTRIES

Homestead and associated entries brought over from last year were 4,916. There were received 36,246 cases, as against 38,088 in the previous year. Pending at end of the year were 5,153 cases. Patents approved included 4,488 homestead entries as against 5,639 the previous year. There were also acted upon 1,079 applications to make second homestead entry as against 1,837; 858 applications to amend as against 802; 1,946 applications for leaves of absence and

for extension of time to establish residence as against 1,008; 9,057 original entries as against 8,033; 15,466 appeals from action of district land officers and this office as against 14,875, making a total of 28,406 applications for second homestead entry, amendments, extension of time and leaves of absence, original homesteads, and appeals acted upon during the year as against 26,555 the previous year.

Public sale applications under section 2455, revised statutes as amended, receiving action were 1,153, against 1,089 the previous year, of which 103 public sales were approved for patenting as against 286 the previous year. Timber and stone cases acted upon were 294 as against 324 the previous year, of which 58 were approved for patenting as against 90 the previous year. There were 17,701 acres returned to the national forests by revocation of orders which had subjected the lands to homestead entry under the act of June 11, 1906, but upon the recommendation of the Department of Agriculture 618 acres in national forests were made subject to such homestead entry.

RESTORATIONS, OPENINGS, AND PREFERENCE RIGHTS OF EX-SERVICE MEN

Under the practice of filing plats of survey and resurvey for lands in States having district land offices, this office issues instructions to the district officers concerning the filing of the plats, the opening of the lands to entry and disposal, the effect had thereon by any withdrawals and reservations, and the preference rights of former service men and others. This office also prepares and later promulgates Executive orders revoking Executive orders of withdrawal. During the past fiscal year letters of instructions have been issued involving 303 plats against 270 in the previous year. In addition, 11 plats for lands in States having no district land office were directly filed in this office and 22 public notices were prepared in connection therewith. Public lands opened to entry through release from withdrawals or through survey or resurvey aggregated 2,473,190 acres. These openings were made subject to the preference rights of ex-service men under joint resolution approved June 12, 1930 (46 Stat. 580).

MINERAL LEASES AND MINING CLAIMS

Oil and gas leases.—On July 1, 1932, there were 21 cases pending for action under sections 14, 17, 18, 18a, and 19 of the act of February 25, 1920 (41 Stat. 437). During the year 1,401 cases were received under above sections, 1,293 were acted upon as compared with 1,209 in the previous year, and 129 remained awaiting action on June 30, 1933. The leases issued during the year were 23 under section 14 for 11,083.19 acres, all resulting from discoveries of oil and

gas on prospecting permits. Eight leases were canceled in entirety and six in part. At the end of the year 802 oil and gas leases embracing 258,063.36 acres were pending.

Oil and gas prospecting permits.—There were 1,149 permits granted, 35 of which were applications filed prior to March 13, 1929, when the Secretary of the Interior refused to permit the filing of further applications for oil and gas prospecting permits. The remainder were granted under the regulations of April 4, 1932, under which permit applications were again received. Nine permits which had been canceled were reinstated. There were 127 assignments acted upon and 1,466 applications for extension of time were considered. During the year 591 permits were held for cancelation and 436 permits were canceled, of which 47 were in Alaska; 568 applications were finally rejected and 755 applications were finally rejected in part. There were 10,369 other actions taken, leaving 2,001 cases pending and awaiting action at close of the year, including 1,634 applications filed under the regulations of April 4, 1932. There are now outstanding 4,443 permits covering 7,382,506.52 acres.

Coal.—At the beginning of the year 100 cases were pending for coal permits, licenses, and leases, and 2,411 cases were received. There were issued 84 coal prospecting permits covering 48,175.03 acres, 32 coal licenses for 1,360.25 acres, and 35 coal leases for 3,316.13 acres. The total number of cases disposed of was 2,413 against 2,153 in the previous year, leaving 98 cases on hand. There are now outstanding 327 leases covering 76,350.15 acres, 94 licenses for 3,733.07 acres, and 270 prospecting permits for 228,867.47 acres.

Potash, sodium, and phosphate.—There were 78 potash permits involving 161,724.78 acres and 3 potash leases covering 8,478.71 acres issued during the year under the acts of February 25, 1920, and December 11, 1928. The total potash leases are now 13, embracing 30,745.24 acres, and the permits are 212 for 455,612.81 acres. Fourteen sodium permits covering 15,665.34 acres and one sodium lease for 640 acres were issued. There are now outstanding the 1 sodium lease and 25 permits for 34,013.85 acres. Four phosphate leases, covering 2,482.90 acres were granted, which bring the total outstanding up to eight leases embracing 5,382.90 acres. Sixty cases involving the above three minerals were pending at the opening of the year and 828 were received; 880 cases were disposed of, leaving 8 cases awaiting action.

Receipts under mineral leasing act.—The receipts for the year under the mineral leasing act of February 25, 1920, were \$2,969,201.72 from oil and gas, \$259,907.79 from coal, \$24,888.93 from potash, \$1,998.55 from phosphate, and \$443.20 from sodium, making the total receipts \$3,256,440.19. The disposition made of these receipts will be found under the title of Receipts and Expenditures.

Oil-shale claims under patent proceedings.—There were pending at beginning of the year 14 mineral applications for 124 oil-shale claims embracing 19,179 acres, and they are still awaiting final action. There were also pending 28 mineral entries for 184 claims covering 24,175 acres and during the year 1 entry was received for 5 claims of approximately 808 acres. There were approved for patenting 7 entries for 56 claims covering 4,997 acres, and 8 entries were canceled for 53 claims covering 8,076 acres. There are still awaiting action 14 mineral entries for 80 claims covering 11,910 acres.

Oil-shale locations.—Forty-nine field reports on locations not included in patent proceedings were awaiting action on July 1, 1932, and 116 were received; all were acted upon. Charges were directed against 873 locations embracing 113,490 acres.

Oil-shale contests.—There were 120 contests against oil-shale locations pending at the beginning of the year, including locations under patent proceedings; 1,655 new cases were added and 1,615 were disposed of, leaving 160 pending. Locations to the number of 11,146 for 1,448,980 acres were declared null and void.

Mineral entries and applications.—There were brought forward from last year 63 mineral entries; 469 were received and 481 adjudicated, leaving 51 awaiting action. There were approved for patenting 201 entries. On July 1, 1932, there were pending 6 mineral applications; 132 were received and 124 disposed of, leaving 14 on hand.

Miscellaneous mineral cases.—There were on hand at the beginning of the year 81 miscellaneous mineral cases; 676 were received and 682 disposed of, leaving 75 awaiting action. These cases were of a highly miscellaneous nature, such as conflicts between mineral and nonmineral claimants, requests for segregation of mining claims, and adjudication of field reports.

Mineral contests.—Exclusive of oil shale, Boulder Dam and Reservoir project, and the San Gabriel Canyon claims, there were 54 mineral contests pending July 1, 1932; 208 were received and 229 disposed of, leaving 33 awaiting action.

MISCELLANEOUS LEASES

Aviation fields.—During the year applications for the use of public lands as aviation fields were considered in 51 instances and 3 leases were issued, and the assignment of 1 lease was approved. Two new applications were received, while 3 applications to erect beacon lights were rejected. There are 13 leases outstanding and 5 permits for beacon lights, totaling 5,196.64 acres.

Fur farming.—The office considered 185 applications for leases on land in Alaska for purposes of fur farming with the following results:

5 applications were rejected, 8 leases were issued, 1 lease was reinstated, 2 leases were canceled, and the assignment of 1 lease was approved. Four new applications for lease were received and await reports from the field for further action. There are 41 leases which are still in full force and effect with an area of 143,712.92 acres.

Stock grazing, Alaska.—Leasing of public lands in Alaska for grazing purposes was considered during the year in 242 instances and 12 applications were rejected, 6 leases were issued, 4 leases were canceled, and the assignment of 1 lease was approved. Ten new applications were received during the year and further action thereon awaits reports from the field. There are 17 leases outstanding under the above act embracing 10,549,449 acres. Six of these leases were granted to associations of natives for grazing of reindeer. The other 11 were leases for grazing cattle, horses, or sheep.

TOWN SITES, PARKS, AND CEMETERIES

Alaska.—During the year patents were issued to the town-site trustee for several Indian villages in Alaska, including Hydaburg, Seldovia, Kake, and Angoon. On July 25, 1932, regulations were issued providing for the relinquishment by the State of Arizona and the city of Tempe, Ariz., of certain lands and the patenting of some of the lands to the Salt River Valley Water Users Association and another part of the lands to the town of Tempe, Ariz., for park purposes. The survey of lots for the town site of Oro Fino, Calif., has been ordered. The town-site reservations for the proposed town sites of Sprole, Mont., and Huberton, N. Dak., were vacated during the year. On August 15, 1932, regulations for the sale of town lots in the town site of Wadsworth, Nev., were prescribed. On July 28, 1932, regulations were issued under the act of July 8, 1932 (47 Stat. 649), which provided for the conveyance to the city of Fallon, Nev., of certain lands for a dumping ground. The survey of the town site of Texhoma, Okla., has been approved and the disposition of the lots developed by the survey is now under consideration.

Parks and cemeteries.—Under the act of September 30, 1890 (26 Stat. 502), providing for cemeteries and parks for cities and towns, there were 13 cases considered during the year and patent was issued for 1 cemetery site. Patents for parks and public reservations under individual acts were issued to the towns of Deaver and Powell, Wyo., and Plummer, Idaho. The lease of Sibley Island in the Missouri River to the city of Bismarck, N. Dak., for park purposes, pursuant to the act of June 11, 1896 (29 Stat. 413-435), was held for cancellation for failure of the city to comply with the terms of said lease.

TRESPASS

During the year the following number of trespass cases were considered: 651 timber, 965 coal, 2 fire, 9 gravel, 3 grazing, 2 cactus, and 1 turpentine. Settlements totaling \$9,963.86 were accepted in the timber cases while the sum of \$5,329.75 was accepted for coal trespasses. In four cases criminal prosecution was recommended. There were also considered during the year 68 cases of unlawful enclosure of public lands, which resulted in the abatement of such unlawful enclosures and the release therefrom of several thousand acres of public land.

ABANDONED MILITARY RESERVATIONS

During the year the sum of \$4,952.56 was realized from sales of lands of the abandoned military reservations of Fort Lowell, Ariz.; Vashon Island, Wash.; Point Campbell, Alaska; and Fort Assiniboine, Mont. Cases of this type were considered in 146 instances, resulting in 23 patents being issued on sales of land and 15 patents on homesteads. Under the act of May 2, 1932 (47 Stat. 141), a patent was issued to the State of Minnesota for a tract of land which was formerly a part of the Fort Ripley Military Reservation.

PRIVATE LAND CLAIMS

The present title of land, to which claims had attached while under the jurisdiction of former governments, continues to be a source of official correspondence and action. Inquiries are received from 143 present owners of such land and from abstract companies or title examiners in behalf of such owners, seeking to ascertain the source and nature of the title and to procure patents as evidence of their title. Inquiries are received from those whose ancestors were among the early inhabitants of the ceded territory, who seek to ascertain whether or not some right or title to such tracts still remains in the Government from which they could derive some benefit or to renew a claim that has been rejected. Six patents were issued during the year in private claim cases.

RIGHTS-OF-WAY

Railroad rights-of-way.—Forty-eight railroad rights-of-way applications were received during the year, which added to the 14 pending, made a total of 62. Twenty-two were approved, requirements made in 36, leaving 4 pending. One hundred and eight reservoir declaratory statement applications were received, which, added to the 5 pending, made a total of 113. Requirements were made in 40 cases, 71 were otherwise disposed of, leaving 2 pending. Six hundred and thirty-five irrigation, telegraph, telephone, public road, pipe line,

etc., applications were received, which, added to 13 on hand, made a total of 648. One hundred and ninety-four were approved, 34 canceled, and requirements made in 404, leaving 16 not yet considered. One hundred and forty maps of approved rights-of-way in forest and Indian reservations were received from the Forest Service and Indian Office and approvals promulgated. The number of approved rights of way of all kinds which were awaiting office action July 1, 1932, was 15, those received 522. Of these, there were canceled by relinquishment or default 30, requirements were made in 290 cases, and 196 were otherwise disposed. Three suits were recommended and four decrees of forfeiture obtained as a result of previous recommendations. Twenty-six suits are pending in the Department of Justice.

STATE GRANTS AND SELECTIONS

Indemnity.—At the beginning of year 145,286 acres of school-land indemnity selections were awaiting action and 1,361,841 acres of new selections were received during the year. Of these, 115,191 acres were approved and certified to the States, 4,862 acres were canceled, 6,254 acres otherwise disposed of, and requirements made as to 902,609 acres, leaving 478,211 acres awaiting consideration at end of year. New quantity selections under grants for specific purposes consisting of 75,017 acres, and selections in connection with which requirements had been made embracing 267,584 acres, together with 60,821 acres not theretofore considered, totaled 403,422 acres. Of this amount, 86,653 acres were approved and certified to the States, selections embracing 3,399 acres were canceled and requirements were made as to 246,262 acres, leaving 67,108 acres not yet taken up for action. Conveyances amounting to 9,090 acres were made to the States with reservation of certain mineral deposits to the United States, including coal, oil, gas, potash, and oil-shale. In addition thereto, 10,196 acres were conveyed to the State of Nevada with a reservation to the United States of all mineral deposits therein

RAILROAD GRANTS AND SELECTIONS

Railroad and wagon-road listings and selections were received to the extent of 201,673.50 acres; 77,273.29 acres were certified or patented in satisfaction of such grants; 7,096.06 acres of selections were rejected; the total acreage adjudicated being 227,087.69.

OREGON AND CALIFORNIA TAX UNIT

Payments to 18 counties in the State of Oregon in lieu of taxes, involving approximately 2,300,000 acres of land, title to which reverted in the Government are made by the United States. The rates are fixed by lawful annual levies on these lands in the same man-

ner as those held in private ownership in the several counties, and the valuations are those used by the Secretary of the Interior in computing the accrued taxes for the year 1915, as reduced by disposal made since 1915. The counties present their claims annually and they are checked and audited by this office and certified to the Secretary of the Treasury for payment in the amounts found to be due. It is necessary to determine from the records and the proofs submitted not only the State and county taxes, but also whether the land is subject to the school, high school, road, port, or other special district tax claimed. A special set of records is kept where each disposal of revested land is noted. The auditing and adjudication of the claims has resulted in net deduction on all claims, or savings to the Government of approximately \$310,000. Following is a tabulation of the tax claims on hand July 1, 1932, and of the claims received and disposed of during the fiscal year 1933:

Claims pending on July 1, 1932:

3 claims for year 1931.....	\$73, 203. 08
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Claims received during fiscal year 1933:

6 claims for year 1931.....	94, 453. 66
18 claims for year 1932.....	491, 936. 02

Total.....	586, 389. 68
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Claims certified during fiscal year 1933:

9 claims for year 1931.....	167, 544. 21
Net disallowance in above claims.....	112. 53

Claims pending on June 30, 1933:

All 1932 claims.....	491, 936. 02
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NOTE.—Nine claims for the year 1931 were certified during the fiscal year 1932 in the sum of \$308,016.42, which was \$1,808.73 less than the amount claimed.

Payments on the 1932 claims amounting to \$491,936.02 have been withheld in accordance with the Comptroller General's decision of April 28, 1933, due to shortage of moneys in the fund from which payments have been heretofore made.

Contests

	Pending June 30, 1932	Received	Decided	Pending June 30, 1933
Mineral.....	54	208	229	33
Oil-shale.....	120	1, 655	1, 615	160
Boulder Canyon project.....	13	17	29	1
San Gabriel Canyon, Calif.....	83	115	193	5
Miscellaneous, Government, and private.....	542	1, 861	1, 771	632
Total.....	812	3, 856	3, 837	831

The cases decided in the previous year were: 129 mineral, 1,777 oil-shale, 428 Boulder Canyon project, 163 San Gabriel Canyon and 1,714 miscellaneous.

WITHDRAWALS AND CREATIONS

Withdrawals of public lands from settlement are made by acts of Congress, by presidential order, or by departmental order where authorized by specific act of Congress. Seven new stock driveways were established during the year and 27 were modified, resulting in the withdrawal of 187,297 acres and the releasing of 60,346 acres from former withdrawals.

There were withdrawn from the unreserved public land 145,344 acres for forest purposes and 25,741 acres were restored. The existing temporary withdrawals for forestry purposes on June 30, 1933, were 131,168 acres, including 17,898 acres withdrawn outside of forest boundaries for administrative sites. During the year 86,256 acres were withdrawn from the unreserved public land for creation of parks and monuments and 778,570 acres were restored. The outstanding withdrawals for the creation of further parks and monuments amount to 2,790,109 acres. There were also 178,309 acres withdrawn for game and bird refuges while 860 were withdrawn for recreational areas. Several small areas aggregating 3,184 in Arizona, California, Nevada, Oregon, and Washington for use of the Department of Commerce as beacon sites or intermediate landing fields in the maintenance of air navigation facilities. At the same time, 2,321 acres were released from such withdrawals.

Public water reserves are created to insure that sources of water in the arid regions will remain open for the public and for livestock. They are also made for the protection of municipal and other public water supplies and are practically net Government land. During the year 33,784 acres were withdrawn and 3,612 acres therefore withdrawn were restored. The outstanding reserves are 471,401 acres. Under Executive order of April 17, 1926, all springs and waterholes providing enough water for general use for watering purposes were automatically withdrawn from entry by requiring with every entry an affidavit of the nonexistence of such a source of water.

Withdrawals for miscellaneous purposes amounting to 63,269 acres were made and 6,979 acres were restored. The outstanding withdrawals for miscellaneous purposes are estimated at 500,000 acres. A summary of the withdrawals existing June 30, 1933 follows:

	<i>Acres</i>
Stock driveways.....	9, 662, 906
Recreational area withdrawals.....	281, 876
Air navigation sites.....	34, 000
Carey Act withdrawals and segregations.....	932, 092
Reclamation withdrawals.....	20, 164, 315
San Carlos irrigation project (Indian).....	136, 860
Water-power reserves (excluding Indian).....	5, 000, 683
Reservoir sites.....	254, 010
Public water reserves.....	471, 401

	<i>Acres</i>
Grazing districts, California and Montana.....	560, 404
Oregon, California, and Coos Bay unrestored timberland.....	1, 260, 854
For Boulder Canyon transmission line.....	2, 040, 210
For forest exchange with State of New Mexico.....	240, 000
For national forest purposes.....	131, 168
For grazing districts in Montana.....	367, 320
For New Mexico-Arizona Indian consolidation.....	1, 134, 972
For national parks and monuments.....	2, 790, 109
For game and bird refuges.....	250, 288
For miscellaneous purposes (estimated).....	500, 000
Total.....	46, 213, 468

The above withdrawals are estimated to contain 27,068,532 acres of Government land in the public-domain States.

MINERAL WITHDRAWALS AND CLASSIFICATIONS

Mineral withdrawals relate to subsurface rights as the surface is usually open to agricultural entries unless a reservation of the surface is also necessary to effect the purpose of the withdrawal. During the year there were restored 1,421,250 acres from coal withdrawals and 2,019,369 acres from oil-shale withdrawals. The outstanding withdrawals for classification, and the further area now classified as mineral, are as follows:

	Withdrawn	Classified
	<i>Acres</i>	<i>Acres</i>
Coal.....	28, 255, 604	32, 645, 314
Oil and gas.....	5, 259, 426	71, 884
Oil shale.....	6, 238, 545	4, 061, 997
Phosphate.....	2, 004, 765	302, 219
Potash.....	9, 411, 906	-----
Helium.....	12, 255	-----
Metalliferous.....	8, 507	-----
Total.....	51, 191, 008	37, 081, 414

The above areas contain much land patented without mineral reservation. In more definite reservations are the naval oil reserves of 77,730 acres, the naval oil-shale reserves of 156,024 acres, and 944,951 acres defined as within the known geologic structure of producing oil and gas fields; these are the gross areas before deducting the private lands.

DISPOSITION OF PUBLIC DOMAIN

The term "public domain" embraces all of the area that was once public land or in the control of the Federal Government, including Alaska. In the United States proper it includes all the States north and west of the Ohio and Mississippi Rivers except Texas, and includes in addition the States of Mississippi, Alabama, and Florida. The total area of the public domain in the United States proper is 1,442,-

200,320 acres. The following is the disposition of this vast area as worked out from available records of disposals and with arbitrary adjustment for final entries and disposals that were later canceled and for exchanges, etc., that resulted in reissuance of patents, and with further adjustment due to purchases of patented lands by the Government for special purposes. The subject, which involves the history of the growth and development of our country, is complex and changing and subject to numerous classifications and exceptions, but the following table pictures the situation in its simplest form.

Title passed from the United States:

	<i>Acres</i>
Homesteads (approximate).....	274, 000, 000
Cash sales and miscellaneous disposals (approximate).....	418, 000, 000
State grants for educational or other purposes.....	181, 650, 470
Canal and river improvement grants to States.....	6, 842, 920
Wagon-road grants to States.....	3, 359, 188
Railroad grants to States.....	38, 206, 390
Railroad grants to corporations.....	94, 155, 512

Total area disposed of.....	1, 016, 214, 480
Pending and unperfected public land entries.....	23, 208, 704

Title remaining in the United States:

National forests.....	137, 576, 500
National parks and monuments.....	8, 370, 989
Indian reservations (estimated net).....	56, 676, 535
Military, naval, experimental reservations, etc. (approximate).....	1, 000, 000
Withdrawals (estimated net).....	27, 068, 532
Unappropriated and unreserved public land.....	172, 084, 580

Grand total.....	1, 442, 200, 320
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REPORT OF THE COMMISSIONER OF INDIAN AFFAIRS

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D.C.

The honorable the SECRETARY OF THE INTERIOR.

SIR: We submit herewith the annual report of the Office of Indian Affairs for the fiscal year ended June 30, 1933.

FOREWORD

The Indian Service is confronting certain main problems and is moving on certain main lines of policy. In part, these problems and these lines of policy are indicated in the narrative report for the fiscal year ended June 30, 1933.

(1) *Indian lands*.—The allotment system has enormously cut down the Indian landholdings and has rendered many areas, still owned by Indians, practically unavailable for Indian use. The system must be revised both as a matter of law and of practical effect. Allotted lands must be consolidated into tribal or corporate ownership with individual tenure, and new lands must be acquired for the 90,000 Indians who are landless at the present time. A modern system of financial credit must be instituted to enable the Indians to use their own natural resources. And training in the modern techniques of land use must be supplied Indians. The wastage of Indian lands through erosion must be checked.

(2) *Indian education*.—The redistribution of educational opportunity for Indians, out of the concentrated boarding school, reaching the few, and into the day school, reaching the many, must be continued and accelerated. The boarding schools which remain must be specialized on lines of occupational need for children of the older groups, or of the need of some Indian children for institutional care. The day schools must be worked out on lines of community service, reaching the adult as well as the child, and influencing the health, the recreation, and the economic welfare of their local areas.

(3) *Indians in Indian Service*.—The increasing use of Indians in their own official and unofficial service must be pressed without wearying. To this end, adjustments of Civil Service arrangements to Indian need must be sought; but in order that standards may not be

lowered, opportunities for professional training must be made genuinely accessible to Indians. With respect to unofficial Indian self-service, a steadily widening tribal and local participation by Indians in the management of their own properties and in the administration of their own services must be pursued.

(4) *Reorganization of the Indian Service.*—A decentralizing of administrative routine must be progressively attempted. The special functions of Indian Service must be integrated with one another and with Indian life, in terms of local areas and of local groups of Indians. An enlarged responsibility must be vested in the superintendents of reservations and beyond them, or concurrently, in the Indians themselves. This reorganization is in part dependent on the revision of the land allotment system; and in part it is dependent on the steady development of cooperative relations between the Indian Service as a Federal agency, on the one hand, and the States, counties, school districts, and other local units of government on the other hand.

The above main purposes will have to be sought in those months ahead which probably will bring a crisis in the economic situation of many tribes. Unemployment and distress are now widespread among the Indians, particularly, but not exclusively in the allotted areas.

The grant of \$5,875,200 for Indian emergency conservation work, made available June 19, will be an important means toward the alleviation of Indian distress, the granting of employment to unemployed Indians, the salvaging and improvement of many areas of Indian land, and the bolder use of Indians in their own professional service.

EMERGENCY CONSERVATION WORK

Under the act of March 31, 1933, President Roosevelt created a Civilian Conservation Corps composed of some 1,400 camps, each of 200 men enrolled for 6 months' service. Of the funds made available by that act, \$5,875,200 were placed at the disposal of the Indian Office, subject to the Director of Emergency Conservation Work, by Executive order of May 12, as amended on May 26 and June 7. Due to delays in perfecting accountancy arrangements, however, no part of that sum actually became available until June 20.

Because of the objections to locating quasi-military units on Indian lands, and because of the complexities of Indian affairs in general, President Roosevelt was convinced that the Indian program should be placed on a separate basis. The 200-men unit, particularly, was adjudged impracticable. The "Indian country" is proverbially a land of great distances; many of the reservations have no important forests; and there could be but few urgently needed work projects, in those sparsely settled regions, large enough to employ 200 men for anything like a 6-months' stretch. Many Indians would sacrifice

needlessly in contracting for a half year's continuous residence in remote camps, where they would be unable to get away for a few days at a time to attend to the seasonal needs of their crops or livestock. Most of the workers would be married and would be loath, for that reason, to sign up for so long an absence. Again, tribal life, as distinguished from family life, might empty the large and expensive encampments on the rather numerous days of tribal or religious festivals—this in addition to much wastage of money and time on transportation.

The President therefore authorized that Indians be mobilized into small work groups and that, in most instances, they live at home or—as experienced campers—maintain their own camps near “the job.” In those cases the allowances to workers for “commutation of quarters and subsistence” would probably cost the Government less—in both cash and man-days—than the constructing and maintaining of large camps.

The Indian program was given still further individuality by Director Fechner, who authorized the Indian Office to appoint its own erosion experts, engineers, and foresters and to do its own disbursing. And he liberalized the age limits of enrolled Indians. Enrollment in the Indian branch was opened to “persons over 18 years of age who are able to perform ordinary labor without injury to themselves” and who are free from communicable disease.

The preliminary allotting of the \$5,875,200—and the quotas of enrolled men by States—will necessarily be revised somewhat in the coming fiscal period. They were the result, nevertheless, of many overtime conferences, at which two considerations ruled: the relative poverty of Indians on different reservations and the relative need for constructive work that could be undertaken under the act of March 31. That work was pretty well limited to forestry and erosion control.

Work projects of wide variety were approved before June 30. Under prevention of forest fires, approved projects include: fire lanes, lookout towers, telephone lines, trails and bridges, roadside clearing and the removal of fire hazards elsewhere. Other forestry projects include nursery work, seed collection, planting, insect pest control, stand improvement, and in some instances landscaping. Under erosion control (largely through prevention of excessive grazing), work projects include erosion dams, range revegetation, boundary surveys, fences, driveways, corrals, springs and reservoirs, rodent control, eradication of poisonous plants, and elimination of useless range stock. Minor flood-control work has been authorized, notably in New Mexico. Improvement of public camp grounds will be a rather important item in most States.

Several of the earliest policies of the I.E.C.W.—as it has come to be known—will be rigorously administered. Supervisory jobs will be

limited. Indians will be given preference in filling all such jobs, from the outset; and they will "take over" as rapidly as they can be trained. Enrolled workers in general will be required to deposit a liberal portion of their earnings into the Individual Moneys, for use during the winter. Purchases of expensive equipment will be kept at a minimum, to insure that a maximum of the Indian fund will go into pay rolls, where it will most promptly serve the destitute.

APPROPRIATIONS

The appropriations for this year aggregated \$22,140,098.35 from the Federal Treasury. This is a decrease of nearly \$5,000,000 under the amount allowed for the previous year. For comparison purposes there follows a tabulation showing appropriations for the service over a 4-year period:

	1931	1932	1933	1934
General purposes.....	\$2,365,808.25	\$2,587,285.73	\$1,840,054.35	\$1,593,500.00
Industrial assistance.....	1,674,000.00	1,605,000.00	1,301,000.00	1,233,881.67
Irrigation and water development.....	436,751.00	497,601.00	457,824.00	599,614.00
Education.....	8,583,398.59	10,185,400.00	9,771,000.00	9,103,230.00
Conservation of health.....	2,338,360.24	3,658,000.00	3,508,800.00	3,281,800.00
Support of Indians.....	1,918,280.00	2,216,300.00	2,156,300.00	2,141,900.00
Miscellaneous (roads, annuities, etc.)....	31,020.00	40,020.00	31,020.00	31,020.00
Subtotal.....	17,347,618.08	20,789,606.73	19,065,998.35	17,984,945.67
Construction.....	4,239,250.00	5,570,440.00	1,654,100.00	711,600.00
Roads.....	396,000.00	670,000.00	1,420,000.00	270,000.00
Total.....	21,984,868.08	27,030,046.73	22,140,098.35	18,966,545.67

In addition to the foregoing authorized expenditures from the general fund of the Treasury, specific appropriations from tribal funds have been made as follows:

	1931	1932	1933	1934
General purposes (including land).....	\$584,249.63	\$332,913.98	\$126,300.00	\$390,501.00
Industrial assistance.....	20,000.00	180,532.21	45,000.00	188,000.00
Irrigation and water development.....	28,500.00	49,500.00	59,000.00	46,950.00
Education.....	1,040,701.08	910,000.00	803,000.00	708,600.00
Conservation of health.....	100,000.00	125,900.00	125,000.00	131,550.00
Support of Indians.....	1,784,538.46	1,767,100.00	1,032,380.00	789,100.00
Miscellaneous (roads annuities, etc.)....	43,000.00	50,000.00	25,000.00	25,000.00
Total.....	3,600,989.17	3,415,046.19	2,215,680.00	2,279,701.00

To this latter class of funds are added certain amounts classed as permanent or indefinite appropriations. With the approach of the new year the service will be required to operate on even less than the amounts actually appropriated in order to make its contributions to the general economy movement.

From last year, 1932, to the coming year, 1934, beginning July, the Federal expenditures for the Indian Service have been cut from \$27,030,047 to \$16,586,059. The reduction is \$10,443,988, or 39

percent. The Indian tribal trust funds available for Indian Bureau costs have been reduced from \$3,385,934 to a sum approximating \$2,450,000—about a \$930,000 diminution. And the tribal trust funds available for payment in cash to the Indians have been reduced from \$3,289,160 to about \$2,000,000. A grand total appropriation of \$33,704,000 for 1932 is cut to approximately \$21,246,000 for 1934, and the total reduction is approximately \$12,458,000.

EDUCATION

Substitution of Federal day schools and public-school facilities for Government Indian boarding schools, a policy now well established in the Indian Service, gained considerable momentum during the last year from budgetary changes made necessary by the Government's economy program.

While this change has occasioned some temporary difficulties in adjustments of school personnel and care of children formerly in boarding schools, it will ultimately result in real benefit to the Indian people, for it carries Government efforts in education back to the reservations where the Indians live and develops local facilities for as many Indian children as possible.

Experience so far, this past year, has proved unusually satisfactory in the instances where change from boarding school to day school has already been accomplished. In enacting the 1933 appropriation bill Congress directed that \$500,000 be shifted from boarding schools to day schools. This shift was carried out with the effect of providing for twice as many Indian children a schooling of a better quality than had been enjoyed by the number transferred from boarding schools. School officials who hesitated to take the step, because of the poor condition of many of the Indian homes, have been surprised to find out how much some of these homes have improved during the short period that has elapsed since the closing of boarding schools, and with what quick responsibility the Indian parents have resumed the care of their children.

It is evident that the reduction of boarding schools and the increase of day schools is not an innovation but is an established policy, whose success is fully demonstrated. In addition, however, the change does assist toward the emergency economies.

It is expected that during the school term 1933-34, from 4,000 to 5,000 of the 22,000 children formerly attending Federal boarding schools will be in attendance at local day schools or public schools. Nearly 60,000 Indian children will be attending public schools and Federal day schools.

There still remain, however, 12,000 unschooled Indian children for whom school opportunities must be provided in the near future. For the great majority of these we plan to provide day schools.

The development of local home schools is being given great impetus by the building program now planned. Activities needed for the development of rural community and home life will be emphasized in all building programs now under way.

PROGRESS

The outstanding significant feature of this year's program in the development of day and public school facilities in lieu of boarding schools was the program on the Pima and Papago Reservation in southern Arizona. The boarding school at Sacaton, Ariz., was changed to a consolidated junior high school, the first to be established on a day basis. Three consolidated schools were built on the two reservations and numerous small local schools. School facilities are now available at home for the larger group of children living on these two reservations.

The boarding schools at Lac du Flambeau, Wis.; Hoopa Valley, Calif.; and Yuma, Ariz., became day schools. The vocational teachers attached to these schools work with the homes so that an adult program is also carried on. One of the boarding schools on the Cheyenne and Arapaho Reservation in Oklahoma and the boarding school on the Tulalip Reservation in Washington were closed and the pupils placed in public schools. Workers were assigned to see that these children were ready for public school and actually enrolled. Another step forward has been the reduction in enrollments in the larger nonreservation schools. These schools have been overcrowded for years, but with the development of facilities at home it has been possible to abolish the lower grades, thus reducing the attendance. Plans were also made for closing the Anadarko boarding school on the Kiowa Reservation, in Oklahoma, and changing the boarding schools on the Shoshone Reservation, in Wyoming, and Colorado River Reservation, in Arizona, to day schools.

In 1933-34, as a result of the reduction in appropriation made necessary by the economy program, the following schools will be maintained on a skeleton basis: Mount Pleasant Indian School, Mount Pleasant, Mich.; Rapid City Indian School, Rapid City, S.Dak.; Genoa Indian School, Genoa, Nebr.; Hayward Indian School, Hayward, Wis.; and the Theodore Roosevelt School, Fort Apache, Ariz. The boarding school at Chemawa, Oreg., will be reduced to 300 students and will be maintained on a strictly vocational basis.

The closing or diminution of the above schools has resulted in the development of some very interesting local community programs. For instance, the larger part of the enrollment in the Genoa Indian School, Nebr., came from the Winnebago Reservation. The morale among the homes on this reservation is at a low ebb, but through placing these children in schools at home, funds are being released to assist

in building up Indian family and community life. The program in the local high schools is being strengthened and adapted to the needs of the Indians by adding vocational courses formerly given at the Genoa School. A community center will be built up, and definite contacts will be insured between the homes and the schools.

Sharp reductions are in process in a number of the large boarding schools such as Haskell Institute, Lawrence, Kans.; Sherman Institute, Riverside, Calif.; and the Indian schools at Phoenix, Ariz.; Albuquerque, N.Mex.; and Chilocco, Okla. Only students who otherwise would not have school facilities are being enrolled. The superintendents of all the changed schools are being held responsible for a check-up of students excluded from their schools.

THE EXISTING DAY SCHOOLS

In 1932 there were 5,063 children enrolled in day schools, while in 1933 this number had increased to 6,836. With the day school building program now programmed these numbers will be greatly augmented. A large number of children who would otherwise not be enrolled in any school will be brought into school.

In the 5 new 1-room day schools established in the northern and southern Navajo jurisdictions in the past year the ages of the children attending ranged from 6 to 17 years. Out of a total enrollment of 219 in these 5 schools, 193 had never attended any school, while only 4 were in grades as high as the third. The enrollment in two of these schools in northern Navajo—namely, those at Red Rock and Sanostee—grew so rapidly that it was necessary to provide an additional teacher before the end of the school year. This expansion of day schools brings a new challenge to teachers, supervisors, and all others responsible for development of a program that shall serve both the children and the adults of the community. Gradually a school program is taking form that provides learning experiences as related directly to children's environmental background. School activities are based on children's individual needs and capitalize the opportunity for preservation of racial culture and for developing the children's creative abilities. Thus the construction of a new church in a Pueblo community is paralleled by a study of some of the earliest church architecture in the Pueblo country and develops into a study of the great cathedrals of the world; a woman of the Santa Rosa village instructs the day school children in making native Papago pottery; an old man of the village of San Juan had a regular weekly schedule on the day-school program for instructing the children in tribal songs in their native language; children give color-expression in illustrating their simple original compositions which serve as reading materials; some Navajo children give poetic expression to their love for the mesa, the pinto pony and their thoughts about the clouds in the sky,

while the Sioux children's lines regarding early Indian history of South Dakota breathe pride in tribal prowess.

Day-school employees are becoming community conscious and are increasingly capitalizing opportunities for affecting the community through school contacts. All the day-school teachers at Pine Ridge remained on the reservation during the past summer in order to guide the children's garden and other group activities organized before the close of school, thus encouraging the parents, many of whom are summer nomads, to remain at home, and develop family vegetable gardens. Early in the spring one of these men teachers organized a baseball team among the younger men of his community and developed a summer schedule of games with other teams on the reservation, thus inducing these men to remain at home during the crop season, contrary to their habit of abandoning their farms during the summer and returning in fall. Community contacts were in several instances made by sponsoring returned-student clubs. A school-community program and dinner was planned last Thanksgiving Day in one of the new Navajo day schools, the mothers furnishing part of the food and participating in preparation and serving and a group of returned students furnishing part of the musical entertainment. Definite steps, too, have been taken to improve the day school teaching personnel. Instead of continuing the practice of using the day schools as a depository for unsuccessful teachers from other classifications and from boarding schools, definite steps have been taken to clear the day schools of employees who are not rendering a satisfactory day-school service. An opportunity was given boarding school teachers to volunteer for day-school work. Supervisors have been definitely recruiting among successful boarding-school teachers who seemed to have the qualities necessary for the new kind of day-school program in the process of development. Some of the outstanding teachers whose positions were abolished through the closing of boarding schools were transferred to day-school positions. Within the limitations of the civil-service regulations, teachers are very carefully selected for all day-school positions from the standpoint of training, experience, and personality.

Ultimately, and the sooner the better, Indians should be the teachers and the local administrators of the Indian schools. Peculiarly is this true of the Indian day schools. To this end, new and expedited teacher-training of Indians is one of the most pressing challenges facing the Indian Service.

PUBLIC SCHOOLS

During the year 1932-33 applications were received and approved from 1,092 State public-school districts for payment of tuition for 15,650 Indian pupils. These applications and the enrollment total

given were for parts of the Indian country exclusive of the territory of the Five Civilized Tribes, Oklahoma, where a special arrangement prevails in accordance with which tuition was paid for 23,411 pupils. Therefore, for the entire country there was an approximate total enrollment of 39,061 for whom tuition was paid.

Reports from all field units show an actual public-school enrollment for the year of 43,988, which includes the total given above for whom tuition was paid. For the Five Civilized Tribes, a careful estimate was made by the Supervisor of Indian Education for Oklahoma of the number of additional children attending school in towns and cities for whom no tuition was paid, the estimated number being 4,406 children. This number is not included in the total of 43,988. Field reports have also shown an additional number of 8,114 children not included in the above total, concerning whom definite information as to school attendance was not furnished. These children belong to families who have left the home reservations and live chiefly in towns and cities. There is reason to believe that many of them are enrolled in the public schools of the communities in which they reside.

In conferences with State and local public school authorities, representatives of the Indian Office have made clear that the purpose is not to place an added burden upon the States, but rather to pool Federal and State resources with the object of securing a better quality of education for both whites and Indians. State supervisors of Indian education employed by the Federal Government but working closely in touch with State school officials have recently been designated for Arizona, South Dakota, Washington, Wisconsin, Nebraska, and Michigan, in addition to Oklahoma, where we have had a State supervisor of Indian education since 1931. The Arizona State supervisor has been charged with the special responsibility of developing an educational program for the Navajos.

VOCATIONAL TRAINING

Justification for the continuation of the senior boarding schools will mainly depend upon their ability to give specialized and practical vocational training of a type not available to the Indians on the reservation or elsewhere. This training must be such as to enable young Indian men and women to earn a living on or off the reservation as the case may be.

To secure this result, steps have been taken this year to develop a more practical type of training. In the senior high schools considerable improvement and progress has been made in the quality and quantity of practical vocational training given. This is evidenced by the number of students who have secured employment upon graduation, as well as by the undergraduates working during the summer

vacation in the fields of employment for which they are being trained, and this notwithstanding the present economic conditions.

New shop buildings were put in service at Carson Institute, Stewart, Nev., Flandreau, S.Dak., Tahlequah, Okla., Tomah, Wis., and Wahpeton, N.Dak. Chilocco, Okla., Haskell Institute, Kans., and Pierre, S.Dak., have new shop buildings under construction.

The courses of instruction are organized along specialized vocational lines and the general maintenance of the boarding school is utilized to give practical training to the students in the various phases of agriculture and industry.

The industrial training program of the community day schools is being extended to include everyone, from the boys and girls in school to the adults at home. The range of agricultural and industrial training activities at these day schools is planned to supply the needs of the community in which it is situated.

The work for girls in the field of home making is now developed to the extent that home-economics teachers are placed in all day and boarding schools where the community situation in connection with the school and the ages of the girls are sufficient to demand this type of training. Practically all assistant matrons and seamstresses in the Indian Service are girls trained in home economics in Indian schools. The program is now organized so that there is a definite carry-over of the training at school into the homes.

SCHOOL SOCIAL WORK

The curtailment of boarding-school enrollment necessitates a careful selective process in order to reserve the boarding school for four special classes of Indian children—(1) orphans who have no homes at all, (2) neglected children whose home environment is wholly demoralizing, (3) children who have no local school facilities; and (4) high-school pupils desiring special vocational training opportunities not offered by local schools. In order to make this possible social workers have been attached to the boarding-school staffs at Chilocco, Genoa, and Mount Pleasant schools. They have visited the homes of pupils in these schools, arranged for attendance at other schools and have followed these children to see that clothing, food, and textbooks are provided in cases requiring special assistance. In the Kiowa jurisdiction the same kind of work was done for all the children enrolled in the two reservation boarding schools. For all of the other boarding schools, where enrollment was to be radically reduced, similar work was done by either school social workers or day-school representatives. It was originally planned that a complete study of the family situation and local school opportunities, together with the necessary guarantee of follow-up on each child, should be obtained for each boarding school before any considerable

changes were made in enrollments. Diversion funds from boarding-school appropriation, however, have been used to render special aid in cases where parents are unable to provide the clothing necessary to keep their children regularly in school, and to provide lunches and text books.

Five of the 13 school social workers have been assigned to special boarding school enrollment work. The other eight have been working on reservations where day school and public school programs were already in effect. Although they too are responsible for the boarding-school enrollment or the withdrawal from boarding school of children depending on home conditions and school facilities, nevertheless the major part of their work is helping parents and children adjust to changed conditions brought about by the children living at home and attending local schools. In these times of economic stress this adjustment has reduced itself in large measure down to looking after such essentials as food, clothing, and cleanliness.

There has been noted on the part of the Indians a growing sentiment in favor of local education and a decided interest in community activities, especially those promoting the welfare of their children. At Truxton Canon jurisdiction, for example, the social worker, herself an Indian, began with a program of community organization. It is expected that in the future social work will fall into two general lines—(1) a continuance of work with individual children and families, and (2) encouragement and development of group participation in a cooperative community program, providing normal recreational, social outlets, and opportunity for community initiative and self-help. The social worker is but one of a group working directly with the Indian children and their parents in the home in order to help them with their problems of adjustment to the complexities of their changing community life.

JUNIOR PLACEMENT AND GUIDANCE

Modified forms of the "outing" system, which have long been a feature of the Indian work, are continuing in operation at Los Angeles, Oakland, Tuscon, and Kansas City. At Haskell Institute and the Phoenix Indian School, a plan of vocational and educational guidance through staff workers in the schools has been inaugurated and is carried on in connection with that of placement in offices in Kansas City and Phoenix. The work in all of the placement and outing centers has been more closely coordinated with that of the local social and civic agencies of the various communities in which they operate. It is planned that within another year the Indian outing work at Oakland will be practically integrated with the local agencies which provide such services to white citizens.

HIGHER EDUCATION

As part of the effort to get away from segregated institutional care for Indians, an increasing number of opportunities for vocational and higher education in established State and local institutions have been set up. As many as 600 Indian youth are attending colleges and universities, of whom 161 are being assisted through Federal or tribal loans and other Government aids. Arrangements have been made to pay the instructional costs of qualified Indian youth at publicly supported institutions and colleges. This is considered more desirable than maintaining a separate university or college for Indians, since it has been demonstrated that Indian youth can successfully utilize the same higher educational institutions as any other group.

INDIAN PERSONNEL

In June of this year there were over 20 Indian young people being graduated from colleges, who wished employment in the Indian Service. Several of the young men have been placed as boys' advisers, teachers in shops, junior and senior high schools; a number of the college-trained Indian women have accepted positions as housekeepers or assistant teachers; others have gone into emergency conservation work camps until such time as they can qualify for positions in their own special fields through civil service examinations. In order that first consideration may be given to qualified Indians who have taken civil service examinations, arrangements have been made with the Commission to provide a special certificate of eligibles who are at least one fourth Indian.

As a part of the effort to continue to recognize ability, training, and initiative in Indians, a number of appointments of Indians to responsible educational positions have been made—Henry Roe Cloud, Winnebago, to the superintendency of Haskell Institute, Kansas; Robert C. Starr, Cheyenne, dean of men in the same school; Kate Wagon Smith, Delaware, school social worker for the Truxton Canon and Colorado River jurisdictions, Arizona; Verna Nori, Pueblo, graduate of Mount Holyoke College, day-school teacher at Santo Domingo Pueblo, N.Mex.; Charles Heacock, Sioux, science teacher in the first reservation high school, Pine Ridge, S.Dak.; Mylie Lawyer, Nez Perce, and Christine Garcia, Papago, home economics teachers at Warm Springs, Oreg., and Pima, Ariz., respectively. Ruth Muskrat Bronson, Cherokee, continues to act as educational counselor and to administer the various educational loan aids.

ALASKA

During the fiscal year the Director of Education for Alaska visited each of the 101 local day schools and the 3 boarding schools.

As a result of information gained on these extended tours and the contacts made with the personnel in the schools and with Territorial school officials and other interested persons, an improved curriculum more adapted to the social and economic needs of the natives is being put into effect. As a preliminary step specific qualifications in the way of education and experience have been set up for the appointment of teachers in Alaskan schools and several changes in personnel have already been made. A supervisor of elementary education with experience in the Indian schools of the West has been transferred to Alaska and is at present making a study of the schools in the southeastern district. As soon as additional funds are available it is hoped to appoint other supervisory officials in special fields such as home economics and agricultural extension.

Due to the reduction in funds it was necessary during the year to change 11 local day schools from 2-teacher schools to 1-teacher schools. The school at Russian Mission on the lower Yukon River was closed due to the small enrollment. The orphanage at Tanana was closed at the end of the year in line with the policy of the Indian Office to provide education for the native in his own community. A number of school children were returned to their homes; others were placed with private native families, and others were transferred to the boarding school at Eklutna on the Alaska Railroad pending placement in private native homes. The 12 blind children at Tanana have been transferred to the Eklutna school, together with their special instructor and matron.

Opportunities for higher education and advanced special training hitherto available to Indians in the States have been extended to Alaska. The following brief statement shows that a total of 16 Alaskan natives are at present being assisted. All of these are beyond high school grades. *

Tuition payments from the fund available for higher education (this is not reimbursable, but a gratuity).....	6
Educational loans (reimbursable).....	9
Working scholarship, providing room and board in return for some work...	1
Total.....	16

HEALTH

Notwithstanding a steadily increasing volume of patient activities, the medical division has had to carry on in the year ending June 30, 1933, with a stationary personnel and stationary or even decreased operating funds. Anticipating reduced funds for the various health activities, the district medical directors were instructed early in the year to devote special attention to the working out in their jurisdictions of improved medical and hospital procedures without increase of existing facilities or enlargement of personnel.

The cooperative activities with other Federal State, county, and local official health agencies, carried on now for several years, have had an excellent effect on the whole of the Indian Service Health Division and have been reflected in increased participation by Indians in matters of disease prevention and physical wellbeing.

The Committee on Indian Affairs of the State and Provincial Health Authorities of North America is continuing its active participation toward the further development of effective health cooperation between the personnel of the Indian field service and those of the various States where Indian groups are included in the State population. This relates especially to the more accurate collection and reporting of vital statistics and of morbidity data, and to the application of various procedures for disease prevention and control. The United States Public Health Service has continued the detail of personnel to the Indian Service, and has made available to a constantly increasing degree the services of various types of health personnel, including medical officers, field directors, sanitary engineers, personnel and facilities of the National Institute of Health, in relation to epidemic disease control, the safeguarding of water supplies, sewage disposal, milk production, the control of venereal disease, and general public health measures.

Laboratories of the State health departments are in many instances performing various types of examinations necessary in the program of medical relief and control of infectious diseases.

Tuberculosis, epidemic outbreaks of infectious diseases, diseases of infancy and childhood, trachoma, etc., continue to demand the attention of all health personnel in view of their outstanding importance in the Indian field. General hospitals of the Indian Service are being made available to an increasing degree for the diagnosis, care, and treatment of tuberculosis, with special emphasis on the reception and segregation of this disease pending necessary and suitable arrangements for transfer for sanatorium care and treatment.

Special emphasis through the activities of the field or public health nurses is being given to maternal and infancy welfare, preschool and school child health, vaccination and inoculation against transmissible disease conditions, the location of tuberculosis in homes and the transfer of such cases to appropriate hospital and sanatorium treatment or supervision where hospitalization is ineffectual.

The number of live births in Indian Service hospitals continues to show material increase from year to year. The following tabulation shows the number of live births in Indian Service hospitals in the years 1928-33, inclusive:

Live births:		Live births—Continued.	
1928.....	595	1931.....	1,360
1929.....	816	1932.....	1,888
1930.....	1,099	1933.....	2,277

The number of examinations for trachoma made by special physicians (not including examinations by agency and school physicians) was approximately 61,426. Of this number, 6,064, or 9.9 percent, were given a positive diagnosis. The number of surgical operations performed during the year for the relief of trachoma totaled 2,599. The number of treatments other than surgical totaled 3,333. These activities were carried forward by special physicians, notwithstanding the broadening scope of their work to include various types of surgery not relating to diseases of the eye and the necessary interruption of their special details to serve in agency hospital or sanatorium positions during emergencies.

For the contagious and infectious diseases reported during the year, the following data are submitted.

Chicken pox, 865, or 222 less than in 1932.
 Diphtheria, 92, or 37 more than in 1932.
 Dysentery, 655 (figures for 1932 not available).
 Erysipelas, 100, or 35 more than in 1932.
 Impetigo, 5,061, or 1,118 more than in 1932.
 Influenza, 23,931, or 9,168 more than in 1932.
 Malaria, 379 (figures for 1932 not available).
 Measles, 2,665, or 1,914 more than in 1932.
 Meningitis epidemic, 79, or 44 more than in 1932.
 Mumps, 810, or 481 more than in 1932.
 Poliomyelitis, 19, or 8 more than in 1932.
 Scabies, 3,291, or 1,205 more than in 1932.
 Scarlet fever, 50, or 44 less than in 1932.
 Septicemia, 61 (figures for 1932 not available).
 Smallpox, 31, or 16 less than in 1932.
 Tinea, 338 (figures for 1932 not available).
 Trachoma, 7,702, or 942 more than in 1932.
 Tuberculosis, all forms, 4,465, or 111 more than in 1932.
 Typhoid or paratyphoid, 131, or 85 less than in 1932.
 Venereal diseases, 2,783, or 124 more than in 1932.
 Vincent's angina, 191, or 70 more than in 1932.
 Whooping cough, 898, or 36 less than in 1932.

The vaccinations and inoculations performed during the year and reported to the Office from the various jurisdictions was 27,844, as follows:

Smallpox.....	8, 822
Typhoid.....	6, 801
Diphtheria.....	10, 952
Other vaccinations and inoculations.....	1, 269

The vaccinations and inoculations for the past 5 years were as follows:

	1929	1930	1931	1932	1933
Total reported.....	25,790	32,286	30,764	37,022	27,844
Vaccinations against smallpox.....	12,966	12,233	11,312	9,955	8,822
Inoculations against typhoid.....	2,686	7,094	6,106	10,610	6,801
Immunizations against diphtheria.....	7,933	10,085	12,675	14,475	10,952
Other (not reported separately):					
Pertussis, Rocky Mountain fever, etc.....	2,205	2,874			
Pertussis.....			198	477	332
Rocky Mountain fever.....			283	607	433
Other.....			190	898	504

The San Xavier Sanatorium, 35 beds, was completed and opened for patients on May 2, 1933. The Pipestone Hospital, with 36 beds, was opened on September 1, 1932. Owing to impoundment of funds for equipment for the Omaha and Winnebago Hospital and the lack of sufficient funds in the appropriation for operation to purchase the required equipment, the new building is not yet open for patients. It is proposed to utilize the usable equipment in the old hospital and put the new facilities into operation as far as practicable. The Clinton Hospital of 30 beds did not open during the fiscal year 1933 owing to delays and difficulties in obtaining water and sewer connections. It was opened October 1, 1933. The Tomah Hospital of 41 beds was opened on June 15, 1933. The Edward T. Taylor Hospital at Ignacio, Colo., with 35 beds, was opened on January 22, 1933. The Hopi-Navajo Sanatorium for tuberculosis will be opened in the fall of 1933.

Construction work on the Albuquerque Sanatorium is proceeding apace under contract which calls for completion by January 15, 1934. Reports indicate that it will be completed prior to that date. The construction of the Sioux Sanatorium at Pierre, S.Dak., is being held in abeyance due to impounding of funds.

A number of States have manifested strong interest in increasing the hospital and sanatorium facilities of State, county, and municipal institutions in order that Indians may be admitted and treated therein. Minnesota has shown material interest in enlarging the facilities of the State Sanatorium at Ah-Gwah-Ching in order that these measures may be brought about. Certain of the county sanatoria in California have also shown evidences of an identical interest. It is believed that to add—at Federal expense if need be—to the facilities of such established institutions, controlled and operated by the States or by groups of counties, would make available to Indians care and treatment at a reasonable cost and under conditions where a comprehensive and satisfactory professional service could be afforded.

Physical improvement in existing Indian Service hospitals and sanatoria has been brought about to a limited extent only in the past year. This relates both to rearrangements of institutional space and to additions to and improvement in diagnostic and treatment equipment.

This report should not be closed without a statement relating to the increasing demands made upon the health personnel in the hospital institutions in the face of decreasing appropriations for the operation of all Indian health activities. The tabulation below will show from 1929 to 1933, inclusive, the beds available, the number of patients treated, the total number of hospital days, and the percentage of utilization of hospital beds.

	Beds	Total patients	Total hospital days	Percentage of utilization
1929.....	3, 162	37, 511	677, 241	59. 5
1930.....	3, 749	38, 536	768, 160	56. 9
1931.....	3, 865	40, 189	869, 625	62. 5
1932.....	4, 048	45, 086	1, 003, 311	68. 8
1933.....	4, 164	50, 376	1, 077, 948	72. 4

There is a further table showing the appropriations from 1929 to 1934. These tabulations indicate the peak year as far as appropriations are concerned in 1932; a decreasing appropriation for 1934.

Year	For hospitals	General purposes	New construction	Total
1929.....	\$966, 000	\$319, 000	\$155, 000	\$1, 440, 000
1930.....	1, 520, 100	623, 500	450, 000	2, 593, 600
Deficiency act.....	500	134, 500	265, 000	400, 000
1931.....	2, 008, 000	758, 000	372, 000	3, 138, 000
Deficiency act.....	38, 000	-----	250, 000	288, 000
1932.....	2, 282, 000	943, 000	\$25, 000	4, 050, 000
Deficiency act.....	27, 500	-----	150, 000	177, 500
1933.....	2, 396, 000	817, 000	-----	3, 213, 000
1934.....	2, 251, 600	744, 600	-----	¹ 2, 996, 200

¹ \$257,400 to remain unexpended for purposes of economy, which includes \$28,600 for Laguna and \$33,100 for Pyramid Lake Sanatorium, which were abandoned. The remainder is principally from hospital operation costs. This does not include 6½ percent of savings to be made by reason of salary reductions.

Reference to the table above will show a constant increase in the number of patients admitted to hospital care and treatment and in the number of hospital days. For example, slightly over 45,000 patients were admitted to Indian hospitals in 1932 and more than 50,000 were admitted in 1933. The number of hospital days in 1932 totaled slightly over 1,000,000, and in 1933 more than 1,077,000. If the major proportion of Indian Service hospitals are to remain understaffed in all departments, and without opportunity to increase personnel to meet the increasing number of patients seeking hospital care and treatment, inevitably there must follow either a curtailment

of patient activities and an actual refusal to admit more than a certain number of Indians to hospital care and attention during a given period of time, or a deterioration in the character and quality of services. Ultimately equaling, or exceeding in importance, the hospital and clinical service to Indians, would be a more all-embracing and more intensive health-education service. Upon such provision the effective control of tuberculosis and of child mortality will ultimately depend upon health education, and the interrelated gains of more and better food and better housing and sanitation. But while recognizing this fact, and hoping to meet its challenge in the years ahead, still we point out that the clinical provision to Indians remains vastly, tragically insufficient.

ALASKAN HEALTH SERVICE

The Alaska Medical Service of the Office of Indian Affairs is conducted for the benefit of the 29,983 Indians and Eskimos inhabiting Alaska. This service is under the general direction of the Director of Health of the Indian Service at Washington, D.C., and under the immediate supervision of Dr. Frank S. Fellows, Medical Director for Alaska, with headquarters at Juneau, Alaska. Both directors are officers of the United States Public Health Service, and the medical work among the natives is conducted in cooperation with that Service.

Mention should also be made of and credit given to the United States Coast Guard, whose officers, physicians, and dentists in Alaska have extended their facilities most cordially to the Indian Service and have themselves rendered valuable medical and dental assistance to the natives at villages reached by the Coast Guard vessels.

The personnel of the Alaska Medical Service under the director consists of 6 full-time physicians, 5 part-time physicians, 1 traveling dentist, 15 hospital nurses, 23 public-health village nurses, and 32 minor employees, including hospital attendants, orderlies, janitors, cooks, etc., making a total of 82 medical employees.

Seven hospitals are maintained as follows:

1. At Akiak, on the Kuskokwim River, with 9 beds.
2. At Juneau, in southeastern Alaska, with 24 beds in the general hospital and 30 additional beds for tubercular patients in the hospital annex building.
3. At Kanakanak, on Bristol Bay in western Alaska, with 15 beds in what were formerly boarding-school buildings, the hospital building having been destroyed by fire.
4. At Kotzebue, in northwestern Alaska, with 20 beds.
5. At Mountain Village, on the Lower Yukon River, with 18 beds.
6. At Tanana, on the Upper Yukon River, to care for Indians in the interior of Alaska, with 22 beds.
7. At Unalaska, on the Aleutian Islands, a small infirmary with 6 beds and a physician in charge.

Small hospitals of 6 beds each, at which no physician is stationed but with a nurse in charge, are maintained at Chitina and Yakutat. During the year a new hospital building with a capacity of 20 beds was constructed at Unalaska. It was put into operation October 1, 1933.

Medical treatment is also furnished Alaskan natives by the following hospitals:

1. Maynard-Columbus Hospital at Nome (a Methodist institution).
2. The Alaska Railroad Hospital at Anchorage.
3. The Children's Orthopedic Hospital, Seattle, Wash.
4. Tacoma Indian Hospital, Tacoma, Wash.
5. Morningside Hospital, Portland, Oreg.

A medical boat with a physician and nurse aboard was operated on the Yukon River during the summer of 1932. Due to decreased appropriations, it was necessary to discontinue the operation of this boat during the summer of 1933.

It also became necessary to close the hospital at Akiak because of lack of funds for its operation. A traveling physician has been appointed to render medical service to the natives of this region.

An effort was put forth during the year to raise the caliber of employees in the Alaska Medical Service. A survey was made of the personnel and there have been a number of changes during the year. Higher qualifications have been set up for physicians and nurses, which applicants must meet before they can secure appointment.

A beginning has been made in the policy of changing the village public-health nurses, serving one village only, to traveling nurses, each serving a number of villages.

Dr. Fellows continued to make frequent tours of inspection and investigation throughout the Territory to direct the medical work and to instruct the employees under his supervision. He has been making a thorough study of health conditions among the natives throughout Alaska.

Tuberculosis continues to be the most prevalent disease among the natives and the facilities for the prevention, care, and treatment of this disease among them are most inadequate. The Alaska Territorial Legislature and the American Legion passed resolutions urging increased appropriations to the Indian Service for combating this disease.

There is need for the construction and operation of at least 1 hospital in each of the 4 judicial divisions, solely for the care and treatment of tuberculous native patients.

The hospital building at Kanakanak, which was destroyed by fire, should be rebuilt. A new medical building is also urgently needed at our boarding school at White Mountain in northwestern Alaska.

Due to the economy program, we are not requesting appropriations for this construction in our estimates for 1935, but the need should be kept in mind. There is also great need for additional traveling public-health nurses to instruct the natives in the prevention of disease, and in follow-up work on cases discharged from hospitals, in addition to the usual treatment of the sick and instruction in the care and feeding of infants and children, adoption of sanitary measures, etc.

Additional public-health nurses would afford greater protection to the Alaskan natives through preventive measures such as vaccination against smallpox and immunization against contagious and infectious diseases.

Concerning whole populations of natives in Alaska, it can be said: A modern health service must be furnished them if they are to survive. Only a beginning as yet has been made.

FORESTRY

The depressed lumber market of 1932 continued on into the fiscal year 1933 and practically stopped all timber sale activities on the Indian reservations. In the spring of 1933 the lumber market showed some improvement, and a feeling of hopeful anticipation was felt throughout the industry. Sales at the Menominee and Red Lake mills increased perceptibly, and the Cady Lumber Corporation at McNary made plans to commence logging on the Fort Apache Indian Reservation sometime during the summer of 1933. Logging operations on the Klamath Indian Reservation had practically come to a standstill, the lumbermen maintaining that the high stumpage rates obtained for the Klamath timber prevented them from carrying on any logging activities on the reservation. On March 4, 1933, public act no. 435 (72d Cong.) was passed. This act made possible a reduction of stumpage rates which, however, could only become effective if the Indians consented to a modification of their timber contracts. During the past summer a special committee of 15 Klamath Indians drew up a tentative, modified contract for approval by the Secretary of the Interior and the lumbermen. If this contract, or something resembling it, is agreed upon by all parties concerned, there should be a great stimulation of the timber business on the Klamath Reservation.

The Klamath Indian Reservation, which for many years has featured prominently in the fight against the pine beetle, reported that due to the severe winter weather a large percentage of the pine-beetle brood had been killed. Consequently, control operations were not considered necessary in the spring of 1933. However, it is important that we do not become too optimistic, for beetle attacks have waned many times in the past only to return with increased severity when

weather favorable to beetle development returned. Epidemic conditions also prevail on the Warm Springs and Yakima Reservations. On the former it is hoped that Indian-conducted logging operations will largely eliminate the infected trees. On the latter the infected stands are so remote that the cost of control measures would be almost prohibitive.

The fire situation in the fall of 1932 was less severe than during the early part of the season. However, fires in the early part of 1933 again forcibly brought to our attention the inadequacy of the forestry personnel. Before satisfactory results can be obtained in the suppression of forest fires it is imperative to build up an organization which will make it possible to meet conditions. It is misguided economy not to provide funds adequately to man our fire organization, for a single bad fire year has often caused damage many times greater than the cost of adequate protection for 20 years and has made impossible the organization of a self-sustaining forestry operations among the Indians.

A substantial allotment for road work on Indian Reservations was received during this fiscal year, and many of the roads so greatly needed on the Indian Reservations were constructed. The need to enlarge the road construction personnel in order to make the best use of the available funds made it necessary to use many of the timber and grazing men for road building. Consequently, as road building was one of the major projects of the year on many reservations, it generally required the full time of the forestry men to the exclusion of all other necessary forestry activities. The fact that timber operations were practically nil greatly aided in enabling us to do the road work without materially increasing the overhead. Many additional roads are needed on various Indian Reservations to help in making the day-school project a success. Proper recognition must be made of the fact that sufficient maintenance funds must be supplied in order to safeguard the initial investment in road construction.

The study of grazing conditions and methods to improve the ranges of the Indian Reservations has been carried on with the small force available for the purpose. However, it was not possible to give this very important phase of forestry adequate attention, due to our limited personnel.

One of the most serious problems confronting the Indian Service is that of range management and erosion control. Thousands of Indians are directly dependent upon the ranges for their livelihood, and therefore range management and erosion control constitute one of the primary problems to be solved in the attempt to bring about more satisfactory living conditions and living standards for the Indians. Our studies to date have indicated the great need for a grazing reconnaissance upon which to base a plan of range management which will

improve the present range conditions, place the Indian livestock industry upon a permanent basis, and avert the costly erosion-control activities which would never be necessary with controlled grazing.

In the latter part of the spring 1933, the emergency conservation work camps were started among the Indians. From the nature of the work authorized by the President under the Emergency Conservation Act, practically all of our foresters were employed as project managers and assistants to superintendents in laying out the work on the various reservations. Forest improvements which had been planned for years, but for which funds had not been available, were suddenly made possible. From results obtained so far the benefits of the emergency conservation works work have not only been material, but have had a desirable influence upon the Indians themselves. Many Indians are becoming much interested in the natural resources on their reservations and a large number of excellent foremen are being developed in the emergency conservation work camps. For years it has been clear that forestry, with all its various activities, such as grazing, road and trail building, telephone line construction, lumbering, and fire protection, provided an ideal occupation for the Indian youth. It is believed that with the emergency conservation work an impetus has been given this thought and great hopes are entertained for teaching and training the Indians along many forestry lines.

IRRIGATION

The Indian irrigation service is moving in the direction of—

- (1) Cancellation of unjust and uncollectible reimbursable indebtedness on Indian irrigated lands;
- (2) The decentralization of responsibility for the maintenance of Indian irrigation—increased responsibility therefor to be vested in local superintendents and in the Indians themselves;
- (3) The readjustment of construction programs, to the end that irrigable lands shall likewise be irrigated and cultivated lands.

The wellnigh insurmountable handicaps on the use by Indians, and the permanent retention by Indians of allotted irrigated lands, still wait to be overcome, as does the handicap imposed by the absence of a system of financial credit for Indian irrigationists.

Activities of the Irrigation Division of the Indian Service are primarily concerned with locating, investigating, and developing a supply of water for the irrigation of such of the Indian lands in the arid and semiarid regions as are economically susceptible of successful cultivation by the artificial application of water and also the development of domestic and stock water by the installation of various types of wells, pumping plants, charcos, small reservoirs, and concrete tanks. Supplementary to its primary functions the Division is charged with the responsibility of protecting school and agency property from

floods, the installation of adequate drainage systems where necessary for lands under the irrigation projects or where necessitated solely by seepage waters rendering otherwise arable areas unfit for successful cultivation, and the supervision and inspection of general irrigation engineering and drainage work when performed under contract with private companies, municipalities, or State political subdivisions.

The legal staff of the Division is responsible for the protection of the water rights of the Indians and the rendering of counsel and advice on the many points of law arising in connection with the above-described activities.

During the past year ordinary operation and maintenance work was performed on the 10 major and numerous minor projects directly under the supervision of or operated by the Service. Routine maintenance consisted of the cleaning and enlarging of hundreds of miles of canal, replacement of numerous dilapidated timber structures with new ones either of concrete or newly milled timber; the installation of metal flumes where needed, and in general the replacement of small dams and other parts of the systems, where funds were available.

Construction activities as a whole were largely curtailed either by reason of lack of funds or the general cessation of such work by the Government prior to initiation of the public-works program.

Surveys and investigations of new and additional reservoir sites with a view to securing a more adequate water supply for a number of the projects were undertaken and a soil expert of the Bureau of Chemistry and Soils, Department of Agriculture, was engaged in classifying the soils of various projects for the purpose of eliminating marginal and other areas not susceptible of beneficial cultivation.

The prevailing low prices for farm products, and other economic factors having a depressing effect on agricultural operations, were instrumental in reducing the irrigated areas as well as the crop returns on the projects.

On the Wapato project, with approximately 100,000 acres under constructed canals of an estimated total of 125,000 acres irrigable, the crop yields were generally good, but the low prices reduced net income to an extremely low figure. Nine miles of transmission line were constructed and the Drop No. 3 generating plant completed.

Surveys at the Flathead project reveal an additional water supply of 50,000 acre-feet urgently needed to insure adequate water for the irrigated lands. The power system operated for the benefit of the project served an average of 1,250 customers. One new reservoir with a maximum capacity of 10,300 acre-feet of water available for the Moiese Valley has been completed with labor furnished by the landowners as an offset against their irrigation charges and the enlargement of an existing reservoir to increase storage capacity from 13,000 acre-feet to 26,000 has been practically completed.

On the San Carlos project very little construction work was undertaken, but during the year an intensive program of canal cleaning was undertaken. Data on the available storage at the Coolidge Dam showed a loss of 161,557 acre-feet for the year. Development of power resulted in a net profit of approximately \$8,000 although, due to prevailing unsatisfactory conditions in the copper industry, the project's one important customer was forced to cancel its contract for power leaving as potential customers numerous small consumers at and near San Carlos as well as the agency itself. Considerable correspondence and numerous conferences between Government counsel and representatives of the other parties to the Gila River adjudication suit culminated in an agreement to the entering of a consent decree by stipulation of the parties. The stipulation at the close of the year lacked the signatures of certain necessary parties which, it is hoped, will soon be obtained thus permitting drafting the proposed consent decree in final form.

Navajo and Hopi water supply activities included the maintenance of existing units and the development of 59 new ones including 4 concrete storage tanks, 12 troughs, and 3 small reservoirs. The total number of units at the end of the year was 785, comprised principally of the various types of wells with or without windmills, 334 springs, the remainder being made up of 90 reservoirs, 32 troughs, and 4 concrete storage tanks.

EXTENSION AND INDUSTRY

Through the work of this division the economic status of the Indians is being improved. Special emphasis has been placed upon developing their individual initiative, thrift, and industry. The extension program for each reservation, wherever possible, has been worked out in cooperation with the Indians through their organizations. The response up to date has been very encouraging, and is a demonstration that Indians can be interested in a constructive program.

Inasmuch as it is necessary to use the calendar year in connection with agricultural statistics, the figures given herein are for the calendar year 1932.

During the past year 558 Indian communities have assisted in working out their agricultural and home programs. Reports showed 605 community organizations with a membership of 24,162. Outstanding among these organizations were the farm chapters and women's auxiliaries. The work has been programmed on a project basis with definite goals of accomplishment set up for each project. The project is an outline of some particular piece of work, showing not only the goals to be reached, but the reasons for undertaking such work and the methods of procedure to be used in doing it. Included

in the project outline is a calendar showing what work is to be done, when and where it is to be done, and who is to do it.

There are 110 administrative units to be served by this Division, made up of 213 reservations scattered through 26 States. The Indian populations of the respective reservations vary in number from a few hundred on the smaller jurisdictions to several thousand on the larger. Each reservation has its own special problems. The different stages of advancement of the Indians vary greatly, making the formulation of suitable programs for the different jurisdictions somewhat difficult. It is quite generally conceded by those in a position to know, that because of the intensive campaign waged on each reservation throughout the year by the superintendents and their extension staffs for an increased production in food products, the Indians entered last winter with a more adequate food supply than they have had in many years.

The garden project, because of its importance in providing an adequate food supply, has received more attention than any other. From 63 jurisdictions reporting it is shown that 22,832 families grew gardens with a total acreage of 22,961. The benefits of the extension program are more clearly set forth in comparative figures from 47 reservations. During last year these jurisdictions reported 15,627 families with 13,552 acres of garden, or an average of 0.86 acre per garden. This year these same reservations reported 3,304 more families raising gardens with a total of 20,550 acres, or an average of 1.08 acres per garden. Each extension employee on these jurisdictions was responsible for an average of over 18 new gardens.

Extension employees made 158,938 personal farm and home visits, held 7,468 meetings with a total attendance of 232,877, and received 256,449 office, 49,417 telephone calls from Indians for information and assistance. Method and result demonstrations conducted in teaching the Indians better farm and home practices numbered 3,641 with an attendance of 50,477. Assistance was rendered 3,081 Indian farmers in securing 28,300 head of better livestock. Farm and home building was stressed, resulting in the construction of 4,693 houses, barns, and outbuildings at a value of \$766,264, and remodeling 2,137 others with a resulting increased value of \$193,961. Fairs, short courses, and picnics were held, totaling 1,235 in number.

4-H CLUB WORK

The total club enrollment was 3,336, consisting of 331 clubs which enrolled 1,492 boys and 1,844 girls. A much higher grade of work was carried on than was evident last year. Efforts were devoted to having the boys and girls complete their work rather than merely endeavor to work up a large enrollment. It is estimated that there are over 40,000 Indian children of club age, showing clearly how this

work could be expanded were funds available for the employment of the necessary workers. Gardening, the most important project, enrolled 931, corn 239, potato 237, poultry 367, swine 223, canning 216, sewing 437, clothing 404, handicrafts 145, and home demonstration work 112. The balance were enrolled in miscellaneous smaller clubs.

The 4-H Club work affords an invaluable medium through which to teach the older Indians improved practices, by seeing their children actually practice them.

HOME EXTENSION WORK

This work was carried on along practically the same lines as last year. Inasmuch as the Indian women do a large share of the gardening for Indian families, the home extension agents assisted materially in this work and are responsible for much of the increase noted. On jurisdictions having such workers, gardens averaged 1.64 acres in size compared with 1.08 acres for the service as a whole, and the number of families on these jurisdictions increased from 2,942 last year to 3,711 this year.

On these jurisdictions 242 dwellings were constructed, or an average of 30 per reservation. The average for the entire service was 16. Poultry houses, totaling 114 were constructed or 14 per reservation, compared with a service average of 9; 121 toilets were built, or an average of 17 per reservation, against a service average of 7; 198 root cellars were built, or an average of 27 per reservation, against a service average of 14. Four special projects were carried in cooperation with the General Federation of Women's Clubs with satisfactory results.

Canning work was stressed with the result that 354,543 quarts of vegetables, fruits, and meats were stored for winter, as well as 803,-678 pounds of dried products. A total of 23,057 articles were made with a total value of \$32,000, and 649 pieces of home-made furniture were constructed. Nutrition work received attention with the result that 1,649 homes adopted improved practices, and 500 homes adopted better practices in caring for their children. Assistance was given the Indians in disposing of their arts and crafts products, and incomplete returns show more than \$350,000 received from such sales.

DAIRY HERDS

Seventy-one dairy herds comprised of 1,816 cows were operated during the year, having as their principal objective an adequate supply of clean milk for the children in the schools and the patients in hospitals and sanatoria. Records of production were carefully kept, which show considerable progress as a result of the modern, scientific practices advocated by this division. During the year 15,167,480 pounds of milk were produced compared with 13,786,355 last year. The average production per cow was 8,353 pounds compared with

8,021 pounds last year. The milk was valued at an average price of \$3.07 per hundredweight, and the increase of 602,466 pounds over the production of last year of the same number of cows was valued at \$18,495.70, clearly demonstrating the value of the practices in force. The total product was valued at \$465,872.13. The total cost of feed was \$117,676.11. The product was consequently valued at \$348,196.02 in excess of the cost of feed.

Properly trained dairymen cared for the feeding, breeding, and production problems of the dairies. The quality of milk produced was in most instances superior to that which could be purchased locally, the aim being to produce milk equal or of higher quality than commercial grade A. A goal of 1 quart of milk per child per day was set, and in most instances was reached.

AGRICULTURAL LEASING AND REIMBURSABLE FUNDS

About 2,700,000 acres of Indian farm lands are under lease to approximately 27,000 tenants. The difficulty experienced during the past few years in collecting rentals has not lessened. Lessees have been faced with drought, crop pests, and depressed prices, which have been used as justifications to ask for modifications, extensions, and in many cases cancelations. The Indian owners of the land have not failed in a willingness to meet the situation; in fact, in many instances it has been necessary to protect them from lessees who would take advantage of them in this respect by negotiating modifications not warranted by the facts. The Department of Justice is cooperating in the recovery of delinquent rentals. Through the efforts of United States attorneys suits are instituted and judgments rendered by Federal courts.

The complications arising out of attempts to collect money rentals are leading to a much larger percentage of crop share leases. This method has the advantage of interesting the Indian lessor in the methods of farming followed by his lessee, and in seeing that the crop is properly divided in accordance with the terms of the lease. The educational value of this experience is apparent, and leads to a desire on the part of the Indian owner to operate his own place.

Full cooperation is being given the Agricultural Adjustment Administration in the campaign to adjust production in cotton and wheat. In this, as in all matters where the Indian is appealed to for a helping hand, he is not found wanting.

The reimbursable funds continue to be of great benefit to the Indians, taking the place, as they do, of the various and sundry forms of credit available to non-Indian citizens which are not available to the Indians whose real property and in many instances his chattels, are under trust to the Government and therefore not considered an adequate credit basis.

The appropriation for the fiscal year 1933 provided \$475,000 for this purpose. This amount, however, included an item of \$150,000 for the subjugation of raw land on the Pima Reservation and \$50,000 for the purchase of sheep for the Jicarilla Indians who suffered a depletion of more than 50 percent of their flocks because of severe storm conditions. This left only \$275,000 for direct use for the usual industrial credit purposes, which was supplemented by certain tribal revolving funds. We now have approximately 53,500 active reimbursable agreements, the total obligations aggregating more than \$3,000,000.

LAND

NAVAJO LANDS

In the vast domain of the Navajo country in Arizona, New Mexico, Colorado, and Utah, where a steadily increasing population demands more land, the picture has been brightened by substantial additions during the past year; and the beginning of Indian emergency conservation work has made possible a real beginning in the critical task of erosion control, with implied range control, throughout the Navajo country.

Under authority contained in the act of May 29, 1928, and subsequent appropriation acts, there have been purchased a total of 307,464.97 acres for the Navajo Indians at a total cost of \$513,034.96. These purchases were made from tribal funds, excepting for 54,373.55 acres which were purchased from a reimbursable appropriation of \$100,000 carried in the act of February 14, 1931. In addition to the lands purchased, tribal funds have paid for the lease of 692,640.41 acres of privately owned land at a total of \$20,801.25.

After a struggle of several years' duration, Congress, by the act of March 1, 1933, returned to the Navajo Reservation a tract of land commonly known as the "Paiute Strip" and added a smaller tract known as the "Montezuma Creek Area." These lands lie in southeastern Utah and comprise approximately 554,000 acres. Legislation was introduced during the past session of Congress to extend the Navajo boundary lines in New Mexico and Arizona. The lines proposed merely to "cover into" the reservation lands which the Navajo Indians have been using for generations; especially is this true in New Mexico, where the proposed boundaries would embrace about 4,000 individual Indian allotments on the public domain together with certain areas purchased for the Indians with their own tribal funds and lands exchanged for the Indians with the Santa Fe Railroad Co.

Under the act of March 3, 1921, exchanges of land with the Santa Fe Railroad have been effected. This work has progressed so far that final exchanges will be made in the near future. A total of

approximately 234,000 acres will ultimately have been exchanged for the Indians.

ALLOTMENTS

Allotments of land in severalty were made to 1,216 individual Indians during the fiscal year 1933 on various reservations, aggregating 152,486.33 acres, as follows:

Reservation	Number of allotments	Acreage
Cheyenne River, S.Dak.....	112	17,884.83
Crow, Mont.....	129	20,640.00
Fort Peck, Mont.....	153	48,680.00
Fort Yuma, Calif.....	1	10.00
Kalispell, Wash.....	17	710.66
Quinalt, Wash.....	801	64,080.84
Standing Rock, S.Dak.....	3	480.00
Total.....	1,216	152,486.33

In addition to these reservation allotments, 24 allotments, embracing a total of 1,970.31 acres were made to Indians residing on the public domain.

The work of making exchanges of allotments on the Gila River Reservation, Ariz., in order to provide each allottee 10 acres of irrigable land, has been continued during the year, and approximately 500 of such exchanges have been completed.

MISCELLANEOUS PURCHASES AND ADDITIONS DURING FISCAL YEAR 1933

Purchases have been made by authority of the act of June 7, 1924, for additions to the Indian pueblos of New Mexico as follows:

	Area	Cost
	<i>Acres</i>	
Nambe Pueblo.....	1.036	\$503.00
San Felipe Pueblo.....	3.159	261.92

Several other purchases are being considered.

The purchase of the Barona Ranch property in San Diego County, Calif., for the Indians of the Capitan Grande Mission Reservation, has been completed. This purchase embraces a total of approximately 5,000 acres at a cost of \$75,000; and will furnish homes and agricultural and grazing lands for the permanent location of between 50 and 60 Indians. Modern homes have been built of concrete block construction, with running water, baths, and adequate sanitary arrangements, and have been furnished comfortably with necessary furniture. Additional purchases for other Indians of this band are under consideration.

Under authority contained in the act of May 4, 1931, 640 acres of land were purchased at a cost of \$2,560, as an addition to the Cahuilla Mission Reservation in California.

Under authority contained in the act of June 6, 1932, part of the Rapid City School Reserve, Rapid City, S.Dak., was exchanged for part of the adjoining Pennington County Poor Farm property.

Approximately 630 acres of privately owned land within the Fort Apache Indian Reservation, Ariz., were acquired, at a cost of \$1,258.11 for addition to the reservation as authorized by the act of March 4, 1931.

EXTENSION OF TRUST PERIODS

The period of trust on reservation and allotted lands was extended during the fiscal year 1933 for 10 years by order of the President on the following reservations:

Round Valley and Temecula Band of Mission Indians, California.

Sac and Fox, Kansas.

Grand Portage and White Earth, Minnesota.

Crow, Montana.

Sac and Fox and Santee, Nebraska.

Devils Lake or Fort Totten, and Standing Rock, North Dakota.

Kiowa and Eastern Shawnee, Oklahoma.

Pine Ridge, South Dakota.

Quinalt and Yakima, Washington.

Shoshone or Wind River, Wyoming.

FIVE CIVILIZED TRIBES

At the end of the fiscal year of 1933, there was on hand in individual Indian moneys the sum of \$26,458,686.52, represented by cash and Government bonds. Of this amount, approximately \$10,000,000 was deposited in the United States Treasury and banks in Oklahoma. The remaining amount of approximately \$16,500,000 was invested in Government bonds.

Every effort is being made to conserve the cash balances of the individual Indians and to direct as wise an expenditure of the funds as possible. During this fiscal year receipts placed to the credit of the individual Five Tribes Indians amounted to \$2,664,464.29, and disbursements were made from their accounts aggregating \$3,259,170.48 to cover their necessary expenses, education, recreation, purchase of homes, farms, and other necessities incident to their being.

On January 27, 1933, the President approved Public, No. 322 (72d Cong.), which placed restrictions upon all funds held by the Secretary of the Interior belonging to Five Tribes Indians of one half or more Indian blood, both enrolled and unenrolled. This act settled the question as to whether or not certain funds held by the Secretary to the credit of issue born after March 4, 1906, upon which the restrictions terminated on April 26, 1931, were restricted. Considerable

litigation concerning this matter was filed during the year. None of the suits, however, reached a final determination until after the act was passed and our Court of Appeals here held that the Secretary had the jurisdiction so conferred. The suits that were not tried have been dismissed as the restrictive status of the funds has been definitely determined.

Due to the removal of restrictions of alienation affected by the act of May 10, 1928 (45 Stat. 495) and the death of Indians leaving full-blood heirs, there were 245 cases of Indian land sales requiring the approval of the local county courts of Oklahoma. Appearances were entered and appraisals submitted to the county judges by the probate attorneys covering these sales. This procedure enabled the Indians to receive a fair value for the land conveyed. During the year, 737 applications were submitted for the removal of restrictions under the act of May 27, 1908 (35 Stat. 312); 460 were approved, 83 disapproved, and 194 were pending at the end of the year. The lands sold under the removal of restrictions granted brought the present-day values which were depressed.

The appropriation to take care of the work of the probate attorneys was decreased \$10,000. This placed an added burden upon the remaining attorneys who, through laborious efforts, appeared in 2,867 cases during the year and instituted 22 civil actions involving \$25,000. Through their efforts, it is estimated that they saved the restricted Indians over \$100,000. On June 30, 1933, there were pending 4,006 cases in the 40 counties which comprise the Five Civilized Tribes area.

The President approved on June 15, an act (Public, No. 53, 73d Cong.) providing for the payment of \$35 per capita payment to the enrolled citizens of the Seminole Nation of Oklahoma.

The Five Tribes, under jurisdictional acts passed in 1924, have filed 52 suits, and under the jurisdictional act of 1932 certain groups of the Cherokees through their attorneys have filed five suits during the fiscal year. Two suits have been filed, one by the Choctaws and Chickasaws, and the other by the Creeks, as a result of Congressional references. This makes an aggregate of 59 suits that have been filed. Of this number 5 were dismissed prior to this fiscal year and 2 during this year. None of the suits so filed has, as yet, reached a final favorable determination to the Indian Nations.

Under the act of January 27, 1933, *supra*, the Secretary of the Interior was granted authority to create trusts with reputable trust companies whereby restricted individual Indian moneys of the Five Civilized Tribes could be so invested as to conserve the corpus of their estates. Regulations concerning the creation of these trusts were made and approved by the Secretary of the Interior on June 2, 1933.

There are now pending approximately 100 suits to clear title to the individual allotments of the Five Tribes' Indians. During the past year approximately 40 suits resulted in favorable decrees to the Indians.

LAND SALES

Sales have been completed during the year ending June 30, 1933, of 139 tracts of original allotted lands, aggregating 16,415.83 acres, for a consideration of \$163,398.84, and of 22,500.56 acres of inherited allotments, for \$260,170.50, making a total area of 38,916.39 acres sold for a total consideration of \$423,569.34. This does not mean that all of this area was sold during the fiscal year, as the sales include both cash transactions and deferred payment sales of former years which were completed during the fiscal year 1932-33. Title in deferred payment sales does not pass from the Government until final payment has been made.

There were issued during the same period, 71 patents in fee, releasing 8,791 acres to allottees or to their heirs, and 589 acres were released through issuance of certificates of competency or by removal of restrictions orders.

A decrease in new sales has been noted and many deferred payment sales due to have been completed during the fiscal year have of necessity been extended although a considerable number have been paid up and completed. On most of the large reservations no attempts have been made at all to hold regularly advertised sales, due to the depressed conditions existing and of the lack of ready money and poor crop prices.

Out of the total shown above, about 8,600 acres were sales between Indians on the Fort Berthold Reservation in North Dakota, where an exchange of money amounting to approximately \$40,000 has passed from one Indian's account to another's, thus benefiting many Indians in their endeavors to improve their individual surroundings without the land passing from governmental control or being assessed for taxation purposes.

Considerable inherited land has been divided or partitioned among the heirs and separate trust patents or restricted deeds given to individual heirs. This procedure is being encouraged in lieu of sales of inherited lands so that the heirs, some of whom have no lands, may be better enabled to establish separate homes and cultivate independent units.

We are continuing the cancelation of patents in fee which were issued without application of the Indian during the period when the so-called "declaration of policy" fee patents were given to Indians prior to 1920. These cancelations are authorized by the act of Congress of February 26, 1927 (44 Stats. 1247), as amended by the act of February 21, 1931 (46 Stats. 1205).

Other activities of this section include the preparation of data to accompany departmental recommendations to the Department of Justice in connection with the institution of suits in the Federal courts to recover lands illegally taken from Indians and to recover taxes and to remove lands from tax assessment rolls where the facts show that such lands should not have been taxed.

NOTE.—Since the end of the fiscal year covered in this report the Department has issued an order precluding the further sale of Indian allotments, issuance of patents in fee, etc., which order is quoted in full below:

[Order No. 420]

PRECLUDING FURTHER SALES OF INDIAN ALLOTMENTS, ISSUANCE OF FEE PATENTS, ETC.

UNITED STATES DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, August 12, 1933.

Letter to All Indian Superintendents:

Due to existing economic conditions and the very poor market for Indian-owned restricted lands, it is hereby ordered until further notice that no more trust or restricted Indian lands, allotted or inherited, shall be offered for sale, nor certificates of competency, patents in fee, or removal of restrictions be submitted to the Indian Office for approval, except in individual cases of great distress or other emergency where it appears absolutely necessary that a restricted Indian tract of land be offered for sale for relief purposes. This order includes any sales or applications for patents in fee already made but not yet submitted by you. Gifts of land on restricted deed forms from one Indian to another for all or a partial interest owned by the grantor, or sales between Indians for a valuable consideration where the circumstances justify such transfers, will not be affected by this order, but such sales or gifts should be limited to cases of necessity only. The foregoing shall apply to the Osages and the Five Tribes Indians insofar as the sale of their land is subject to control by this Department.

Please acknowledge receipt of this order.

JOHN COLLIER, *Commissioner.*

Approved, August 14, 1933.

HAROLD L. ICKES,
Secretary of the Interior.

TRIBAL ENROLLMENT

A roll was prepared in accordance with the act of March 3, 1931, of children born to enrolled members of the Blackfeet Tribe between the closing of the final roll, December 30, 1919, and September 3, 1931. This roll was approved September 9, 1932.

In accordance with the provisions of the act of May 18, 1928, as amended, a roll of the California Indians was approved May 16, 1933.

A roll of the Capitan Grande Mission Indians of California was approved March 8, 1933. This roll was for the purpose of dividing the newly purchased Borona Ranch and distributing the proceeds of

the sale of the Old Capitan Grande Reservation by condemnation by the city of San Diego, Calif.

INDIAN SUITS

No new Indian suits were filed in the United States Court of Claims during this fiscal year. The court handed down decisions in the Blackfeet and Assiniboin cases on April 10. A motion for new trial in each of the cases was filed June 10 and the litigation is still in the court.

INDIAN CLAIMS

An appropriation of \$19,357 was authorized by the act of February 16, 1933, to pay claims of individual Sioux Indians awarded under the act of May 3, 1928. The appropriation was carried in the Second Deficiency Appropriation Act and the superintendents have been instructed to disburse the available funds to the Indian claimants.

PUEBLO LANDS

The act of May 31, 1933, made an additional appropriation of \$761,954.88 to the various Pueblos which had been awarded compensation by the Pueblo Lands Board under the act of June 7, 1924, in consideration of the future action of the Pueblos in dismissing all pending suits brought by them and their abstinence from the institution of new litigation. These pueblo compensation funds can by the terms of the act of June 7, 1924, be used only for the purchase of needed lands and waters and for other permanent economic advantages. The Pueblos were given initiative and veto power with respect to the uses of their own funds. An appropriation was made also by the same act to pay the non-Indian claimants in settlement of awards made to them by the Board. The amount appropriated for this purpose was \$232,086.80 in full settlement of the awards. Regulations have been prepared to govern the disbursement of the funds and instructions have been sent to the field officials to make payment.

OIL, GAS, AND OTHER MINERALS

Activity in acquiring and developing restricted Indian lands for oil and gas mining purposes has been at a low ebb during the past fiscal year. The industry has been subject to many uncertainties. The market price of crude oil in the Mid-Continent field, where most of our producing leases are located, has been the subject of more than ordinary variations. Much of this has been due to uncertainty existing in respect to the control of producing wells in the East Texas and Oklahoma City flush fields. A flat posted price of 25 cents a barrel for oil of all gravities was in effect from April 4 to June 17, when the price was raised to 52 cents a barrel. Previously during

the year oil was moved from the Mid-Continent field under prior contracts for as low a price as 10 cents a barrel.

A good grade of oil was discovered within the limits of the Blackfeet Reservation in Montana. Interest in acquiring and developing oil leases on that reservation was accordingly increased and bonus values considerably enhanced.

A number of wells have been completed within what is known as the Maverick Springs oil field within the ceded area of the Shoshone Reservation in Wyoming. The wells have remained closed in for a number of years. Notice was served upon the lessees within the entire ceded Shoshone area to begin producing and selling oil from completed wells by September 1, 1933, or show cause why their leases should not be canceled. Protests were filed by lessees, and the matter was set down for hearing May 17. Thereafter the entire situation was carefully studied with the result that the lessees have agreed to pay \$1 per acre per year additional rental for the lands included in their leases, such additional payment to be allowed to accumulate against production royalties when the marketing of oil begins.

During the year several matters were referred to the Department of Justice with recommendation that suit be instituted to collect damages alleged to be due restricted Indians in Oklahoma because of the pollution of streams and water supply resulting from improper disposition of waste matter from refineries. The total amount involved in claims is \$28,950.

The following statistical information may be of interest:

Number of leases in force at end of year.....	4, 838
Total acreage leased during the year.....	48, 215
Total acreage under lease at end of the year.....	1, 900, 150
Number of producing oil wells drilled during the year.....	52
Number of producing gas wells drilled during the year.....	15
Number of dry holes completed during the year.....	28
Total number of producing oil wells at end of year.....	13, 803
Total number of producing gas wells at end of year.....	622

Gross oil production for year:

Five Civilized Tribes Agency.....barrels..	12, 344, 658
Osage Agency.....do.....	8, 871, 545
Other agencies.....do.....	1, 291, 073
Income from oil and gas leases for the year.....	\$3, 423, 556. 48

The act of Congress approved April 1932 authorized the making of new leases on developed tracts of the Choctaw and Chickasaw segregated coal lands in Oklahoma. Several leases have since been approved, but interest in these lands is at a very low ebb, primarily because of the great amount of natural gas and fuel oil within the competitive limits of these coal fields.

QUAPAW LEAD AND ZINC LEASES

Within the limits of the Quapaw Indian Reservation in the north-eastern corner of Ottawa County, Okla., there are 16,762 acres of restricted land belonging to 159 allottees or heirs of allottees. This area is a part of the tri-State zinc and lead mining district. Lead and zinc mining operations were first undertaken on this reservation in 1902. In 1907 an additional productive area was opened, and in 1914 what is known as the Picher field was discovered. Since 1917 production of lead and zinc from these lands has increased enormously, and at the present time the mines on the reservation on both fee and restricted lands produce 70 percent of the total value of the tri-State district output.

At the close of the fiscal year there were 41 departmental lead and zinc mining leases in force, embracing 5,924 acres. On this acreage there were 18 subleases of 1,127 acres. There were sold from these mines during the year 49,065.32 tons of lead and zinc concentrates, from which the Indians received royalties amounting to \$120,124. The royalty returns from these leases increased 66 percent over the previous year.

During a large part of the year a number of the mines were idle under shut-down permits approved by the Department on applications of lessees.

CANCELATION OF REIMBURSABLE INDEBTEDNESS

By act of Congress of July 1, 1932 (47 Stat. 564) the Secretary of the Interior is authorized to adjust or eliminate reimbursable charges of the Government of the United States existing as debts against individual Indians or tribes of Indians.

During the year the following debts have been canceled:

Roads and bridges reimbursable from tribal funds.....	\$870, 353. 53
Tribal herds reimbursable from tribal funds.....	116, 970. 00
Irrigation, construction operation and maintenance, reimbursable from individual Indians.....	2, 128, 146. 08

Charges against 19 separate roads and bridges were canceled; 10 of these were in the Navajo jurisdiction in the States of Arizona and New Mexico; the others were located in seven States. The indebtedness for tribal herds were for former herds on 4 reservations, 3 in Montana and 1 in Nevada. The indebtedness canceled on irrigation was on 14 irrigation projects in five States.

Further recommendations for the cancelation of reimbursable debts were prepared during the year and will be submitted to Congress at the beginning of its next session. This is in accordance with the provisions of the act referred to above, which requires an annual report to Congress of cancelations which become effective at the end of 60 legislative days if no action is taken on them by Congress.

INDIAN RESERVATION ROADS

The construction and improvement of roads on Indian reservations is one of our greatest needs, both from the standpoint of the convenience of the Indians and for administration purposes. Because of the lack of funds, the reservation road program may be said to be still largely in the pioneer stage. The appropriations for the past 6 fiscal years, given below, speak for themselves. It should be kept in mind that the total land area of these reservations exceeds that of all the New England States together.

Fiscal year	Regular appropriation	Special appropriation	Fiscal year	Regular appropriation	Special appropriation
1928.....		\$9, 000	1932.....	\$500, 000	\$45, 000
1929.....		150, 000	1933.....	400, 000	¹ 1, 195, 000
1930.....	\$250, 000	25, 000			
1931.....	250, 000	89, 000	Total.....	1, 400, 000	1, 513, 000

¹ Approximately \$600, 000 of the 1933 appropriation was withdrawn in the spring of 1933 under the provisions of the act of Congress of March 31, 1933.

During the year road work has been undertaken on approximately 80 reservations, the work being directly under the superintendents, assisted by a small supervising engineering staff and by local reservation personnel. By act of Congress, Indians are employed for all positions, except engineering, supervision, and machine operative. Even in these positions they are employed where qualified men are available.

In formulating road programs the needs and wishes of the Indians are given careful consideration. Care is also exercised in locating the roads so as to secure proper alinement, grades, and the greatest economic value. With the limited funds available for the work it has been necessary, however, to restrict construction activities to the making of dirt roads, and the graveling or surfacing of many of the roads to permit all-year use is an urgent matter. Preference is given to roads needed for the transportation of children to schools. No funds appropriated to the Indian Service may be used for any work on roads included within the Federal aid system. Close cooperation is maintained between the Indian Service and the counties where county roads have been built on reservations, and county roads of a special benefit to the Indians. A plan has been developed by which, in such counties, the counties furnish the engineer and machinery and the Indian Service furnishes the Indian labor.

Close cooperation is had also with the United States Bureau of Public Roads and other Federal bureaus, which have been very helpful in an advisory capacity.

LEGISLATION

Aside from legislation of general application and appropriation bills, more than 35 separate laws affecting Indian matters were enacted during the year. The importance of these statutes varies. There were five acts authorizing per capita payments to Indian tribes as an aid in overcoming difficulties brought on by adverse economic conditions. There were 10 or more so-called private relief bills involving as many subjects. Of outstanding importance are the following:

Public 241 (72d Cong.), approved July 1, 1932: This act authorized the Secretary of the Interior to adjust reimbursable debts of Indian tribes. On December 15, 1932, the Secretary reported to Congress the cancelation of \$3,115,469.61 and later submitted a report indicating further cancelation of \$153,697.41.

Public 405 (72d Cong.), approved March 1, 1933, commonly referred to as the Paiute Strip bill. This is more fully discussed under the section of the report dealing with land matters.

Public Act 28 (73d Cong.), approved May 31, 1933, relates to matters of vital interest to the Pueblos of New Mexico. This also is discussed at another place in the report.

Public 410 (72d Cong.), approved March 2, 1933: This act authorizes the submission of an alternate budget for the service for the fiscal year 1935, and is the first step in revamping the present complex financing of the activities of the service so that the Indian budget will be understandable to any who examine it, and will show proposed expenditures by functions at each unit in the service.

Public 435 (72d Cong.), approved March 3, 1933, authorized modification of timber contracts to meet present conditions, but specified certain safeguards.

Public 417 (72d Cong.), approved March 3, 1933, modified the act of January 16, 1933, granting relief to water users on Indian reclamation projects. These acts applied to the Indian Service relief measures similar to those afforded occupants of other Federal irrigation projects.

Public 427 (72d Cong.), approved February 3, 1933, authorized the use of more than \$1,000,000 awarded the Uintah and other Ute Indians, Utah, for purposes of direct benefit to the individual members of the tribe, thus removing the fund from obligation for administrative purposes.

Several hundred pieces of legislation introduced in the House and Senate were reported upon during the course of the year. Some matters considered of vital importance could not be acted upon favorably because of unfavorable financial conditions.

CONSTRUCTION

The major construction activities included roads, day schools, and hospitals, the details of which are related under the appropriate headings in this report. Due to the pressing demand for economy, construction appropriations available for 1933, exclusive of road funds, were nearly \$4,000,000 less than for last year. During March 1933 practically all construction was stopped abruptly, and the unexpended balances of appropriations impounded. This threw many

Indians and others out of work, retarded the development of our day-school program, and increased the demands for relief on many reservations. Requests have been prepared for submission to the Public Works Administration for funds to replace those impounded and to enlarge to a considerable extent the construction activities of the service. It is our aim to have buildings designed in harmony with local surroundings, using native building materials wherever possible, and giving the maximum of employment to Indians.

INDIAN RELIEF

General economic conditions among the bulk of the Indian population continued unfavorable during 1933. In common with the general trend throughout the country, the extent of Indian relief has increased manyfold during the past few years.

Generally unfavorable economic conditions, particularly in the farming and livestock industries from which the greater part of the normal Indian income is directly or indirectly derived, and the difficulty—even impossibility—of securing outside employment have naturally reacted to the serious disadvantage of the Indian. In the vicinity of many of the reservations, work for Indians, able-bodied and willing, was simply not to be had. The market for Indian handicraft and other products has dwindled. The traders are overstocked with such goods; the volume of credit which these merchants could extend the Indians has been greatly curtailed.

Some sections witnessed a recurrence during 1933 of serious drought conditions and grasshopper infestations, though the Indians' crops, particularly their subsistence gardens, showed considerable improvement over the previous year. During the spring and summer of 1932 particular emphasis was placed upon a subsistence gardening campaign among all the Indian tribes; also upon canning, drying, and storing campaigns with the Indian women. The Indian Service assisted by providing seed, implements, and other needs, and by furnishing the initial advice and encouragement and the necessary follow-up work. Results were gratifying.

It is extremely difficult adequately to budget the relief needs of the service a year or more in advance. The unusual needs of the past winter, therefore, have meant a marshaling of all possible sources of help to supplement the inadequate amount of money available in our regular gratuity and tribal support appropriations. Based upon our presentation of probable needs the Congress granted us an additional \$50,000 for relief purposes in the second deficiency act, fiscal year 1932.

More than 40 carloads of clothing was secured for issue to needy Indians from surplus stocks of the War Department. Among the items included were 35,000 pairs of breeches, 123,000 suits of woolen

underwear, 6,000 coats, 40,000 overcoats, 33,000 shirts, 24,000 pairs of shoes, 176,000 pairs of socks, 25,000 caps, 10,000 pairs of leggings, and 1,000 mufflers.

The Indians continued to share in the distribution of flour and of cotton goods and garments through the Red Cross. Approximately 5,000,000 pounds of flour were secured from this source, together with many thousands of yards of prints, gingham, muslin, outing flannel, shirting and other kinds of cloth, and a large quantity of underwear, hose, outer garments, sweaters, comforters, and blankets. In the distribution of these garments especial attention was given the need of the women and children, the clothing received from the War Department surplus being almost entirely for the men.

The whole-hearted and efficient cooperation of the American Red Cross in Indian relief work during the past 2 years is gratefully acknowledged.

Almost our sole source of Indian work relief during the fiscal year was the \$1,400,000 of road money made available by Congress, \$1,000,000 in the Emergency Relief Act, and \$400,000 in the regular annual appropriation act. This money was apportioned with relief needs in mind, and served the twofold purpose of furnishing needy Indians with employment and providing low-cost reservation roads for Indian use.

Much help was secured for scattered Indians through the cooperation of some of the better organized State relief programs. Notably in Wisconsin, Minnesota, South Dakota, and Montana, the State relief administrations included scattered Indians in their program, and in return the Indian Service field officials frequently served ex officio as agents for the State or as members of local county committees.

The launching of the emergency conservation program at the end of the fiscal year marked the beginning of a constructive and adequate program. Combined with other public-works enterprises, it promises a planned and systematic work-relief program which will be a satisfying substitute for the strain of the necessarily precarious program of the past year.

The compelling thought underlying any Indian Service relief work is that the Indian is not to be pauperized, is not to be led to feel that he is automatically entitled to be accepted as a responsibility of the Federal Government simply because he has a degree of Indian blood. The attitude of the bulk of the Indian population is most heartening, and it is our hope and belief that when the present depression shall have passed, the Indian people will have lost little, if any, ground in their progress toward the goal of self-support and economic independence.

REORIENTING INDIAN LAND POLICY

It is only recently that we have come fully to realize the magnitude of the disaster which the allotment law of 1887 has wrought upon the Indians. This law, in its origin, was intended to be a civilizing instrument for the Indians. It was reasoned that white civilization was based on the individual property system, and it was naively assumed that the way to make the Indian a responsible citizen was forcibly to give him private property and extinguish his concern in community property. But, in fact, the allotment law turned out to be principally an instrument to deprive the Indians of their lands. The successive steps of loss are easy to trace: Each Indian on the allotted reservations was given an allotment of about 160 acres, which was held in trust by the Government for a time and then turned over in fee simple to the allottee. In most cases, the allottees sold their land to white settlers in order to have "easy money" for quick spending. If the allottee died before the end of the trust period, the land passed to his heirs. Often there were numerous heirs, and the practicable method of settling the estate was to sell it and divide the money among the claimants. A third step in the loss of Indian land came from the disposal of so-called "surplus" lands which were left after allotments had been made to all Indians of the reservations. These surplus lands were then opened to entry and were homesteaded by white settlers.

Of the lands owned by the Indians in 1887, the year of the allotment law, two thirds have been lost by these various processes of dissipation. In addition, some 17 million acres are now traveling the same route to ultimate loss, although the Department by administrative order has stopped the further sale of "heirship" lands pending revision or repeal of the allotment law. As was to have been expected, much of the lost land has been the best, leaving often the cull remnants for the Indians.

The allotment system has been peculiarly unfortunate in its application to forest and grazing lands. For sustained forest management, directed to continuous tree-crop production, it is essential that timber lands be managed in large, contiguous areas. Likewise, good management of range lands can best be brought about by community use. The partition of the Indian forests and grazing ranges has made intelligent management of these resources in many cases impossible or exceedingly difficult.

How, then, shall we reorient Indian land policy? It is clear that the allotment system has not changed the Indians into responsible, self-supporting citizens. Neither has it fitted them to enter into urban industrial pursuits. It has merely deprived vast numbers of them of their land, turned them into paupers, and imposed an ever-growing relief problem on the Government. As a starting point for

a rational policy, we can categorically say that the immediate problem is not that of absorbing the Indians into the white population, but first of all of lifting them out of material and spiritual dependency and hopelessness. It is equally clear that the place to begin this process is on the land; for if the Indian cannot pursue the relatively simple and primitive arts of agriculture, grazing, and forestry, there seems little prospect that he can be fitted for the more exacting technology of urban industry. Even if he could be at once so fitted, the industrial depression has taught us that we already have far too many industrial workers. And the agricultural depression has taught us that we have a great surplus of farm land. Through subsistence farming and animal husbandry, the Indian can become self-supporting without competing, on the one hand, with white industrial labor or, on the other hand, with white commercial agriculture.

If these assumptions are sound, the main lines of the new land policy are clear. The allotment system must be reversed. We must reacquire enough of the lost lands or of other lands to provide subsistence for eighty or ninety thousand landless Indians. In the case of forest and range lands, we must reestablish tribal ownership and build up Indian use of these resources instead of allowing the resources to be exploited by whites. Even in the case of agricultural lands, community ownership, with assignment of use to individual Indians, will in many reservations be the best system of ownership. In addition to land, we must provide capital in the way of buildings and other improvements, work stock, livestock, and farming equipment to help the Indian farmer or livestock grower onto his feet. In the forests we must provide small portable sawmills and logging equipment in order to employ the Indian workers in harvesting their own tree crops. Equipping the land for productive use will require, in short, the provision of credit facilities for the Indians.

If we can relieve the Indian of the unrealistic and fatal allotment system, if we can provide him with land and the means to work the land, if through group organization and tribal incorporation we can give him a real share in the management of his own affairs, he can develop normally in his own natural environment. The Indian problem as it exists today, including the heaviest and most unproductive administration costs of public service, has largely grown out of the allotment system which has destroyed the economic integrity of the Indian estate and deprived the Indians of normal economic and human activity.

Sincerely yours,

JOHN COLLIER,
Commissioner.

APPENDIX

INDIAN POPULATION

An Indian, as defined by the Indian Service, includes any person of Indian blood who through wardship, treaty, or inheritance has acquired certain rights. The Census Bureau defines an Indian as a person having Indian blood to such a degree as to be recognized in his community as an Indian. Furthermore, the population enumerated at the Federal agencies is not necessarily domiciled on or near the reservations. It is the population on the agency rolls and includes both reservation and nonreservation Indians. Thus an Indian may be carried on the rolls because of tribal or inheritance rights, etc., and may reside anywhere in the United States or in a foreign country. Reports of births and deaths among absentees are often not received. In many instances certification is made to the State registrars of vital statistics and thus to the Census Bureau, but not to the Indian Service. In a considerable number of cases the addresses of the nonreservation Indians are unknown. For the above reasons the statistics of Indian population as shown in the decennial reports of the Bureau of the Census do not agree with the statistics of the Indian Service.

Since funds were not available to secure the services of temporary employees for coding and tabulating the 1933 census rolls, the April 1, 1933, Indian population was tabulated in the field by the various agencies. In order to check the tabulation made from the census rolls three additional tabulations were required, showing all changes made on census rolls since 1932. One tabulation shows the changes by exact cause under the two headings, "Additions" and "Deductions". Under "Additions" were shown separately the births for the past year, unreported births for previous years, enrollment by departmental authority, etc., while under "Deductions" were grouped separately deaths for the past year, unreported deaths for previous years, dropped by departmental authority because of wrongful enrollment, duplications, etc. The second tabulation reports these same changes by residence of Indians, and the third tabulation shows all Indians on both the 1932 and 1933 census rolls who have changed their residence—the residence in 1932 reported under "Deductions" and the residence in 1933 under "Additions". The additions and deductions on the second and third tabulations were added to and subtracted from the 1932 population and the results equal the tabulations from

the 1933 census rolls. This gives not only a check on the tabulations but an analysis of all changes at each jurisdiction.

The total estimated and enumerated number of Indians thus reported in 1933 was 320,454. This number consists of 231,754 Indians actually enumerated and 88,700 Indians taken from earlier or special censuses and estimates based on records. For convenience, the latter number will be considered hereafter as an estimate. (See tabular statement below.)

The Bureau of the Census reported 72,643 Indians of the Five Civilized Tribes in 1930, and this number has been substituted for our previous estimated population of the Five Civilized Tribes. (See p. 49 of the Annual Report of the Commissioner of Indian Affairs, June 30, 1931, for further discussion on the estimated population for Five Civilized Tribes.)

The aggregate estimate and enumerated number of Indians reported by Federal agencies on April 1, 1933, represents an increase over the corresponding figure for the previous year of 3,220 or 1 percent.

Of the 231,754 Indians enumerated, 118,076 were males, 113,672 females, and for 6 the sex was not reported.

It is significant when the Indians enumerated are considered that 197,852, or 85.4 percent, resided at the Federal jurisdiction where enrolled, while only 5,013, or 2.2 percent, resided at another jurisdiction, and 28,889, or 12.5 percent, resided elsewhere; that is, outside of any Federal jurisdiction.

Of the 32,447 Indians residing elsewhere on April 1, 1930, 41 were living in the New England States, 208 in the Middle Atlantic, 3,633 in the East North Central, 9,234 in the West North Central, 437 in the South Atlantic, 93 in the East South Central, 2,166 in the West South Central, 5,120 in the Mountain States, and 6,024 in the Pacific States, and for 5,491 Indians the residence was either not reported or unknown.

The combined population of four States, Oklahoma, Arizona, New Mexico, and South Dakota, is 199,388, or 62.2 percent of the total Indian population.

Oklahoma has far more Indians than any other State. If the Federal census population for the Five Civilized Tribes is included, the Indian population is 94,707, or 29.6 percent of the aggregate Indian population. Arizona ranks next with 43,927, or 13.7 percent, followed by New Mexico with 34,196, or 10.7 percent, and South Dakota, 26,558, or 8.3 percent of the total population. According to the enumerated population no other State has an Indian population of over 15,000.

Heretofore the entire population of Southern Navajo Reservation was reported under Arizona. This year the population of the reservation extending over into New Mexico is included under that State,

hence the seeming decrease in the population of Arizona and the unusual population increase in New Mexico.

A census of all California Indians was recently compiled, the rolls being approved by the Bureau of Indian Affairs on May 16, 1933, too late, however, to be included under this year's enumerated population. The California rolls numbered 23,787, as approved. This number includes 19,304 Indians now enrolled and reported in table 2, and shown in estimated statement. Next year this census will add to the enumerated Indian population of California over 4,400 Indians.

According to a tabulation of the tribes enumerated on April 1, 1930, the most important numerically were the Navajo, Sioux, including Assiniboin, and Chippewa, numbering 40,862, 33,168, and 23,647, respectively.

The Indian population not actually enumerated (termed an estimate) is 88,700, which is compiled as follows:

California, Sacramento Agency, part of, 1930 estimate.....	8, 761
Michigan, 1927 census.....	1, 192
New York, 1932 estimate.....	4, 523
Oklahoma, Five Civilized Tribes, Bureau of the Census, 1930.....	72, 643
Texas, 1931 special report.....	250
Washington, Taholah Agency, scattered bands, 1932 estimate.....	1 511
Wisconsin:	
Rice Lake Band of Chippewas, special census, July 1930.....	221
Stockbridge Reservation, Keshena Agency, 1910 census.....	599

In the following table the Indian population as reported by the United States Fifteenth Census for 1930 is given for States in which there are no Federal agencies.

Doubtless many of these Indians are duplicated in the columns "Residing elsewhere" in table 2, showing Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, April 1, 1933.

Table 1.—Indian population ^a of States in which there are no Federal Agencies, 1930

Division and State	Total	Male	Female	Division and State	Total	Male	Female
Total.....	10,456	5,557	4,899	South Atlantic:			
New England:				Delaware.....	5	3	2
Maine.....	1, 012	518	494	Maryland.....	50	34	16
New Hampshire.....	64	33	31	District of Columbia.....	40	17	23
Vermont.....	36	20	16	Virginia.....	779	436	343
Massachusetts.....	874	458	416	West Virginia.....	18	15	3
Rhode Island.....	318	154	164	South Carolina.....	959	474	485
Connecticut.....	162	90	72	Georgia.....	43	26	17
Middle Atlantic:				East South Central:			
New Jersey.....	213	123	90	Kentucky.....	22	16	6
Pennsylvania.....	523	305	218	Tennessee.....	161	85	76
East North Central:				Alabama.....	465	228	237
Ohio.....	435	252	183	West South Central:			
Indiana.....	285	158	127	Arkansas.....	408	210	198
Illinois.....	469	250	219	Louisiana.....	1, 536	800	736
Western North Central:				Texas ^b	1, 001	516	485
Missouri.....	578	336	242				

^a Fifteenth Census of the United States, 1930.

^b 250 Indians are included in the preceding tabular statement.

¹ During 1933, 150 Indians of the scattered bands were allotted on the Quinaielt Reservation and included in the enumerated population, table 2.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Total	Male	Fe- male
Total enumerated Indian population 1	231,754	118,076	113,672	6	197,852	101,455	96,391	6	5,013	2,404	2,549	28,889	14,157	14,732
Arizona 2	43,927	22,677	21,244	6	42,262	21,810	20,446	6	248	113	135	1,417	754	663
Colorado River Agency	1,129	618	511	---	601	326	275	---	31	21	10	497	271	226
Cotoioro River Reservation	687	369	318	---	537	286	251	---	24	18	6	126	65	61
Chemehuevi	272	135	137	---	174	87	87	---	1	1	---	97	47	50
Chemehuevi-Chippewa	1	2	1	---	1	1	---	---	---	---	---	3	2	1
Chemehuevi-Paiute	3	1	2	---	---	---	---	---	---	---	---	1	1	---
Chemehuevi-Papago	1	1	---	---	---	---	---	---	---	---	---	3	2	1
Cocopah	4	1	3	---	---	---	---	---	---	---	---	1	1	---
Mission	1	1	---	---	---	---	---	---	1	---	1	3	1	2
Mojave	350	193	157	1	323	175	148	---	10	8	2	17	10	7
Mojave-Chemehuevi	17	12	5	---	13	9	4	---	---	---	---	4	3	1
Mojave-Cocopah	4	2	2	---	4	2	2	---	---	---	---	---	---	---
Mojave-Hopi	1	1	---	---	1	1	---	---	---	---	---	---	---	---
Mojave-Papago	1	1	---	---	1	1	---	---	---	---	---	---	---	---
Mojave-Pawnee	8	4	4	---	8	4	4	---	---	---	---	---	---	---
Mojave-Pawnee	2	1	1	---	2	1	1	---	---	---	---	---	---	---
Mojave-Pima	2	1	1	---	2	1	1	---	---	---	---	---	---	---
Mojave-Pueblo	1	1	---	---	1	1	---	---	---	---	---	---	---	---
Mojave-Yuma	18	11	7	---	7	3	4	---	11	8	3	1	1	---
Paiute	1	1	---	---	---	---	---	---	---	---	---	---	---	---
Yuma	1	1	---	---	---	---	---	---	---	---	---	---	---	---
Fort Mojave Reservation	442	249	193	---	64	40	24	---	7	3	4	371	206	165
Chemehuevi	3	1	2	---	---	---	---	---	---	---	---	3	1	1
Maidu	1	---	1	---	---	---	---	---	---	---	---	---	---	---
Mojave	420	242	178	1	63	39	24	---	3	3	1	354	200	154
Mojave-Maidu	1	1	---	---	---	---	---	---	---	---	---	1	1	---
Mojave-Mission	4	2	2	---	---	---	---	---	---	---	---	1	1	---
Mojave-Paiute	3	---	3	---	---	---	---	---	---	---	---	4	2	2
Mojave-Pima	5	2	3	---	---	---	---	---	---	---	---	3	2	3
Mojave-Pima	3	---	3	---	---	---	---	---	---	---	---	3	2	3
Mojave-Yuma	4	1	3	---	1	1	---	---	3	---	3	5	2	3
Paiute	1	---	1	---	---	---	---	---	---	---	---	---	---	---
Fort Apache Agency and Reservation (Apache)	2,737	1,429	1,308	---	2,704	1,400	1,295	---	5	3	2	28	17	11
Fort Yuma Agency in California, and Cocopah Reservation (Cocopah)	26	15	11	---	26	15	11	---	---	---	---	---	---	---
Havasupai Agency and Reservation (Havasupai)	201	111	90	---	201	111	90	---	---	---	---	---	---	---

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933.—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female
Arizona—Continued.														
Hopi Agency and Reservation	6,063	3,452	2,911		5,950	3,095	2,855		15	8	7	98	49	49
Hopi-Blackfeet	2,515	1,308	1,207		2,421	1,263	1,158		11	5	6	83	40	43
Hopi-Cherokee	2	2							2	2				
Hopi-Klamath	1		1		1	1								
Hopi-Laguna	2	2	1		2	1	1							
Hopi-Navajo	3	3	1		10	3	7					3	2	1
Hopi-Papago	10	1	7		2	1	1							
Hopi-Pima	13	6	3		11	4	7					2	2	
Hopi-Pueblo	6	3	3		1	1						5	2	3
Hopi-Shasta	5	2	3		5	2	3							
Hopi-Shoshone	8	5	3		3	2	1					5	3	2
Hopi-Zuni	3	1	2		3	2								
Navajo	3,492	1,818	1,674		3,490	1,817	1,673		2	1	1			
Pueblo	1		1		1									
Leupp Agency and Navajo Reservation	1,865	935	980		1,864	935	929					1		1
Navajo	1,856	932	924		1,855	932	923					1		1
Navajo-Hopi	2	2			2	2								
Navajo-Oneida	4	1	3		4	1	3							
Onelda	2		2		2		2							
Paiute	1		1		1		1							
Paiute Agency in Utah, and Kaibab Reservation (Paiute)	96	55	41		92	53	39					4	2	2
Phoenix School Jurisdiction	1,669	882	787		1,399	746	653		68	24	44	202	112	90
Camp Verde Reservation (Apache)	440	244	196		294	167	127		1	1	1	145	77	68
Fort McDowell Reservation (Mojave-Apache)	190	106	84		164	92	72		8	2	6	18	12	6
Salt River Reservation	1,039	532	507		941	487	454		59	22	37	39	23	16
Apache	1		1				1							
Pima	1,037	532	505		939	487	452		59	22	37	39	23	16
Pueblo	1		1				1							
Pima Agency	5,255	2,716	2,539		5,167	2,672	2,495		30	8	22	58	36	22
Chul Chinschu Reservation (Papago)	363	197	166		363	197	166							
Gila Bend Reservation (Papago)	233	128	105		233	128	105							
Gila River Reservation	4,659	2,391	2,268		4,571	2,347	2,224		30	8	22	59	36	22
Maricopa	539	263	276		534	260	274					5	3	2
Maricopa-Apache	1	1			1	1					1			
Maricopa-Cheyenne	7	5	2		7	5	2							

[illegible]

For footnotes see p. 144.

Table 2.—Indian population in Continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction				Residing elsewhere			
	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Sex not re- ported
California—Continued.																
Fort Yuma Agency, see Arizona, and Fort Yuma Reservation (Yuma)	868	415	393	—	706	360	346	—	5	3	2	—	97	52	45	—
Hoopa Valley Agency	1,336	954	982	—	1,474	735	736	—	7	4	3	—	455	212	243	—
Hoopa Valley Reservation	1,336	750	786	—	1,266	627	639	—	7	4	3	—	263	119	144	—
Hoopa	555	288	267	—	493	258	235	—	7	4	3	—	55	26	29	—
Klamath	981	462	519	—	773	369	404	—	—	—	—	—	208	93	115	—
Rancheria	400	204	196	—	298	111	97	—	—	—	—	—	192	93	99	—
Bear River (Bear River)	23	13	10	—	19	11	8	—	—	—	—	—	4	2	2	—
Blue Lake (Blue Lake)	70	37	33	—	46	20	26	—	—	—	—	—	24	17	7	—
Crescent City (Smith River)	47	18	29	—	65	36	29	—	—	—	—	—	47	18	29	—
Eel River (Miami)	145	73	70	—	78	44	34	—	—	—	—	—	80	39	41	—
Smith River (Smith River)	115	61	54	—	1,966	1,087	879	—	6	2	4	—	37	17	20	—
Mission Agency	2,900	1,541	1,359	—	—	—	—	—	—	—	—	—	928	452	476	—
Augustine Reservation (Mission)	14	8	6	—	12	7	5	—	—	—	—	—	2	1	1	—
Cabezon Reservation (Mission)	28	17	11	—	23	12	11	—	—	—	—	—	5	5	—	—
Cahuilla Reservation (Mission)	105	55	50	—	66	36	30	—	—	—	—	—	39	19	20	—
Campo Reservation (Mission)	136	71	65	—	117	60	57	—	1	1	—	—	18	10	8	—
Capitan Grande Reservation (Mission)	156	82	74	—	124	70	54	—	—	—	—	—	32	12	20	—
Cuyapaipe Reservation (Mission)	5	1	4	—	—	—	3	—	—	—	—	—	2	1	1	—
Inaja Reservation (Mission)	32	16	16	—	27	12	15	—	—	—	—	—	5	4	1	—
Laguna Reservation (Mission)	3	2	1	—	3	2	1	—	—	—	—	—	—	—	—	—
La Jolla Reservation (Mission)	222	120	102	—	120	70	50	—	—	—	—	—	102	50	52	—
La Posta Reservation (Mission)	5	2	3	—	4	2	2	—	—	—	—	—	—	—	—	—
Los Coyotes Reservation (Mission)	87	50	37	—	67	42	25	—	—	—	—	—	20	8	12	—
Manzanita Reservation (Mission)	66	29	37	—	57	28	29	—	—	—	—	—	9	1	8	—
Mesa Grande Reservation (Mission)	216	120	96	—	134	79	55	—	3	1	2	—	79	40	39	—
Mission Creek Reservation (Mission)	21	11	10	—	13	7	6	—	—	—	—	—	8	4	4	—
Morongo Reservation (Mission)	294	157	137	—	192	115	77	—	—	—	—	—	102	42	60	—
Pala Reservation (Mission)	203	106	97	—	148	77	71	—	1	—	1	—	54	29	25	—
Palm Springs Reservation (Mission)	49	23	26	—	48	23	25	—	—	—	—	—	—	—	—	—
Puma Reservation (Mission)	69	38	31	—	46	28	18	—	—	—	—	—	23	10	13	—
Pechanga Reservation (Mission)	219	111	108	—	95	51	44	—	—	—	—	—	124	60	64	—
Rincon Reservation (Mission)	183	98	85	—	99	52	47	—	—	—	—	—	84	46	38	—
San Manuel Reservation (Mission)	42	23	19	—	27	16	11	—	—	—	—	—	15	7	8	—
San Pascual Reservation (Mission)	9	4	5	—	3	2	1	—	—	—	—	—	6	2	4	—

Santa Rosa Reservation (Mission)	49	30	19	23	13	10	26	17	9
Santa Ynez Reservation (Mission)	92	43	49	20	11	9	72	32	40
Santa Ysabel Reservation (Mission)	238	132	106	172	97	75	65	35	30
Soboba Reservation (Mission)	126	63	63	107	53	54	19	10	9
Sycuan Reservation (Mission)	36	17	17	34	17	17	2	2	6
Torres-Martinez Reservation (Mission)	195	112	83	182	105	77	13	7	6
Sacramento Agency	3,310	1,612	1,612	3,079	1,576	1,503	217	114	103
Fort Bidwell Reservation	122	74	43	82	50	32	31	19	12
Mojave	1	1	1	1	1	1	1	1	1
Paite	115	73	42	80	50	30	26	18	8
Paite-Mojave	3	1	2	2	2	2	3	1	2
Paute-Wasco	2	2	2	2	2	2	1	1	1
Snohomish	1	1	1	1	1	1	1	1	1
Fort Bidwell Reserve and Public Domain Allotments	448	215	233	326	155	171	121	59	62
Maidu	1	1	1	1	1	1	1	1	1
Paite	123	63	63	27	13	14	96	47	49
Pit River	308	147	161	282	134	148	25	12	13
Pit River-Paite	16	7	9	16	7	9	1	1	1
Round Valley Reservation	822	414	408	783	389	394	35	23	12
Kato	1	1	1	1	1	1	1	1	1
Maidu	105	107	88	191	104	87	3	2	1
Mission-Pomo	3	1	2	3	1	2	1	1	1
Papago	1	1	1	1	1	1	1	1	1
Papago-Pomo	2	2	2	2	2	2	1	5	1
Pit River	40	24	16	33	19	14	6	5	1
Pit River-Pomo	1	1	1	1	1	1	1	1	1
Pomo	103	49	54	96	42	53	6	6	1
Pomo-Maidu	24	11	13	24	11	13	11	6	1
Pomo-Wallaki	18	9	9	18	9	9	9	9	1
Pomo-Wintoon-Wallaki	1	1	1	1	1	1	1	1	1
Wailaki	190	84	106	179	80	99	11	4	7
Wailaki-Maidu	16	9	7	16	9	7	7	4	1
Wailaki-Wintoon	5	1	4	5	1	4	3	3	1
Wilkut	12	9	3	9	6	3	3	3	1
Wintoon	114	59	55	110	57	53	4	2	2
Wintoon-Maidu	2	1	1	2	1	1	1	1	1
Wintoon-Pomo	3	2	1	3	2	1	2	1	1
Yuki	69	32	37	67	31	36	2	1	1
Yuki-Kato	4	2	2	4	2	2	1	1	1
Yuki-Maidu	4	3	1	4	3	1	4	4	1
Yuki-Pomo	13	8	5	13	8	5	5	5	1
Yuki-Wallaki	1	1	1	1	1	1	1	1	1
Tulare County Indians	121	66	55	121	66	55	66	55	1
Apache-Navajo	1	1	1	1	1	1	1	1	1
Cherokee	2	2	2	2	2	2	2	2	1
Cherokee-Waksuchi	4	2	2	4	2	2	2	2	1

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Sex not re- ported
California—Continued.												
Sacramento Agency—Continued.												
Tulare County Indians—Continued.												
Chukchansi.....	1	1			1	1						
Intumbich.....	6	4	2		6	4						
Intumbich-Wikhamni.....	13	6	7		13	6	7					
Koyati.....	1	1			1	1						
Koyati-Waksachi.....	2	2			2	2						
Monachi.....	5	3	2		5	3						
Tachi.....	2	1	1		2	1	1					
Tachi-Waksachi.....	4	3	1		4	3	1					
Tachi-Wikhamni.....	5	2	3		5	2	3					
Tolon.....	19	9	10		19	9	10					
Waksachi.....	21	11	10		21	11	10					
Wikhamni.....	22	12	10		22	12	10					
Wikhamni-Cherokee.....	2	2			2	2						
Yawilmani.....	9	6	3		9	6	3					
Yawilmani-Waksachi.....	2	1	1		2	1	1					
Tule River Reservation.	183	95	88		169	88	81		14	7	7	
Koyati.....	1	1			1	1						
Pankahlachi.....	41	22	19		34	20	14		7	2	5	
Serrano.....	5	2	3		5	2	3					
Serrano-Yawilmani.....	6	3	3		6	3						
Tachi.....	1		1		1							
Tolon.....	15	8	7		15	8	7					
Tolon-Wikhamni.....	3	2	1		3	2	1					
Tolon-Yawilmani.....	7	2	5		7	2	5					
Wikhamni.....	19	11	8		19	11	8					
Wikhamni-Tachi.....	2	1	1		2	1	1					
Yaudanchi.....	1	1			1	1						
Yawilmani.....	72	35	37		65	30	35					
Yawilmani-Pankahlachi.....	7	4	3		7	4	3		7	5	2	
Yawilmani-Wikhamni.....	3	3			3	3						
Rancheria.	587	305	282		587	305	282					
Chowchilla.....	3	2	1		3	2	1					
Chukchansi.....	101	58	43		101	58	43					
Chukchansi-Monachi.....	21	10	11		21	10	11					
Chukchansi-Paute.....	1	1			1	1						

Mission-Navajo	1	2	2	4	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2</
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For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction				Residing elsewhere			
	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Sex not re- ported	Total	Male	Fe- male	Sex not re- ported
Colorado																
Consolidated Ute Agency, see Utah	819	416	403	---	808	411	397	---	8	3	5	---	3	2	1	---
Southern Ute Reservation (Ute)	819	416	403	---	808	411	397	---	8	3	5	---	3	2	1	---
Ute Mountain Reservation (Ute)	383	188	195	---	376	185	191	---	6	3	3	---	1	---	---	---
Florida: Seminole Agency and Reservation (Seminole)	436	228	208	---	432	226	206	---	2	---	---	---	2	---	---	---
Idaho	368	280	288	---	368	280	288	---	---	---	---	---	---	---	---	---
Coeur d'Alene Agency, see Washington	4,262	2,086	2,116	---	3,545	1,752	1,793	---	168	103	65	---	489	231	258	---
Coeur d'Alene Reservation	748	372	376	---	545	276	269	---	14	9	5	---	189	87	102	---
Coeur d'Alene	633	311	322	---	444	221	223	---	14	9	5	---	175	81	94	---
Coeur d'Alene-Blackfoot	558	279	279	---	378	191	187	---	11	7	4	---	169	81	88	---
Coeur d'Alene-Cherokee	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Coeur d'Alene-Chippewa	9	5	4	---	8	4	4	---	1	1	---	---	1	---	---	---
Coeur d'Alene-Colville	1	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
Coeur d'Alene-Cree	5	1	4	---	4	---	3	---	1	---	1	---	---	---	---	---
Coeur d'Alene-Flathead	12	6	6	---	12	6	6	---	---	---	---	---	---	---	---	---
Coeur d'Alene-Kalispel	11	6	7	---	9	4	5	---	---	---	---	---	2	---	---	---
Coeur d'Alene-Kootenai	1	1	---	---	1	1	---	---	---	---	---	---	---	---	---	---
Coeur d'Alene-Kootenai	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Coeur d'Alene-Maidu	1	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
Coeur d'Alene-Nez Perce	1	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---
Coeur d'Alene-Okanagan	2	1	1	---	2	1	1	---	---	---	---	---	---	---	---	---
Coeur d'Alene-Spokane	3	2	1	---	3	2	1	---	---	---	---	---	---	---	---	---
Coeur d'Alene-Umatilla	19	8	11	---	16	7	9	---	1	1	---	---	2	---	---	---
Coeur d'Alene-Umatilla	7	2	5	---	7	2	5	---	---	---	---	---	---	---	---	---
Cree	2	2	---	---	2	2	---	---	---	---	---	---	---	---	---	---
Kootenai Reservation	115	61	54	---	101	55	46	---	---	---	---	---	14	6	8	---
Kootenai	109	59	50	---	98	53	45	---	---	---	---	---	11	6	5	---
Kootenai-Colville	6	2	4	---	3	---	3	---	---	---	---	---	3	---	3	---
Fort Hall Agency and Reservation, see Utah	1,838	940	898	---	1,616	825	791	---	34	21	13	---	188	94	94	---
Bannock	275	144	131	---	208	109	99	---	8	4	4	---	59	31	28	---
Bannock-Shoshone	69	30	39	---	66	30	36	---	1	1	---	---	2	---	2	---
Maidu-Bannock	1	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
Shoshone	1,332	689	643	---	1,198	620	578	---	23	15	8	---	111	54	57	---
Shoshone-Bannock	161	77	84	---	143	66	77	---	2	2	---	---	16	9	7	---
Fort Lapwai Agency and Nez Perce Reservation (Nez Perce)	1,417	666	751	---	1,210	556	654	---	100	63	37	---	107	47	60	---
Western Shoshone Agency and Reservation, in Nevada	1,417	108	91	---	1,174	95	79	---	20	10	10	---	5	3	2	---
Palute	124	70	54	---	105	61	44	---	17	8	9	---	2	1	1	---

[illegible]

For footnotes see, p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Montana—Continued.												
Tongue River Agency and Reservation	1,516	780	736	1,433	736	697	59	32	27	24	12	
Cheyenne	1,469	753	716	1,401	719	682	46	23	23	22	11	
Cheyenne-Arapaho	2	1	1				2	1	1			
Cheyenne-Arikara	6	2	4	6	2	4						
Cheyenne-Chippewa	2	1	1	2	1	1						
Cheyenne-Cree	9	4	5	9	4	5						
Cheyenne-Crow	3	2	1	3	2	1						
Cheyenne-Kiowa	2	2					2	2				
Cheyenne-Sioux	21	13	8	10	6	4	9	6	3	2	1	
Sioux	2	2		2	2							
Nebraska												
Winnebago Agency	4,446	2,291	2,155	3,072	1,554	1,518	356	196	160	1,018	541	477
Omaha Reservation	2,770	1,440	1,330	2,163	1,101	1,062	120	72	48	487	267	220
Omaha	1,595	833	762	1,333	684	649	32	18	14	230	131	99
Omaha-Bannock	1,542	804	738	1,282	655	627	32	18	14	228	131	97
Omaha-Chippewa	6	3	3	6	3	3						
Omaha-Iowa	2	2								2		
Omaha-Ponca	6	3	3	6	3	3						
Omaha-Potawatomi	22	10	12	22	10	12						
Omaha-Seneca	4	2	2	4	2	2						
Omaha-Sioux	6	5	1	6	5	1						
Omaha-Winnebago	5	4	1	5	4	1						
Winnebago Reservation	1,175	607	568	830	417	413	88	54	34	257	136	121
Winnebago	1,154	598	556	815	412	403	87	53	34	252	133	119
Winnebago-Chippewa	1	1					1	1				
Winnebago-Kickapoo	3		3	3		3				2		1
Winnebago-Ojibwa	12	4	8	10	3	7						
Winnebago-Sac and Fox	1	1		1	1					3	2	
Winnebago-Sioux	4	3	1	1	1					531	274	257
Yankton Agency, in South Dakota	1,676	851	825	909	453	456	236	124	112	385	185	100
Ponca Reservation (Ponca)	399	192	207	191	96	95	23	11	12	165	85	100
Ponca Reservation (Santee)	1,277	659	618	718	357	361	213	113	100	346	159	157
Nevada	5,083	2,535	2,548	4,779	2,396	2,383	204	88	116	100	51	49
Carson School Jurisdiction	2,070	1,003	1,067	1,985	972	1,013	81	27	54	4	4	
Fort McDermitt Reservation (Paiute)	2,270	125	1,145	2,248	120	1,128	22	5	17			
Summit Lake Reservation (Paiute)	65	34	31	65	34	31						

Public Domain	1,735	844	591	1,672	848	854	59	22	37	4	4	-----
Paiute	243	104	139	239	102	137	3	1	2	1	1	-----
Paiute-Miami	1	1	1	1	1	1	1	1	1	1	1	-----
Shoshone	926	445	481	925	445	480	1	1	1	1	1	-----
Washo	548	284	264	491	261	230	54	20	34	3	3	-----
Washo-Klamath	1	1	1	1	1	1	1	1	1	1	1	-----
Washo-Onedda	2	1	1	2	1	1	1	1	1	1	1	-----
Washo-Paiute	14	9	5	14	9	5	1	1	1	1	1	-----
Washo-Paiute	572	287	285	511	256	255	1	1	1	1	1	-----
Pyramid Lake Agency and Reservation	566	284	282	505	253	252	1	1	1	1	1	-----
Paiute	2	2	2	2	2	2	2	2	2	2	2	-----
Paiute-Washo	3	1	1	3	1	1	1	1	1	1	1	-----
Shoshone	3	1	1	3	1	1	1	1	1	1	1	-----
Washo	1	1	1	1	1	1	1	1	1	1	1	-----
Paiute Agency, in Utah	198	97	101	179	89	90	1	1	1	1	1	-----
Moapa River Reservation (Paiute)	157	79	78	141	72	69	1	1	1	1	1	-----
Las Vegas Tract (Paiute)	41	18	23	38	17	21	1	1	1	1	1	-----
Walker River Agency, see California	1,734	880	854	1,671	849	822	54	26	28	3	3	-----
Fallon Reservation (Paiute)	424	215	209	405	204	201	19	11	8	1	1	-----
Mason and Smith Valleys	436	221	215	419	215	204	17	6	11	1	1	-----
Maidu	1	1	1	1	1	1	1	1	1	1	1	-----
Paiute	411	205	205	394	200	194	17	6	11	1	1	-----
Paiute-Maidu	2	1	1	2	1	1	1	1	1	1	1	-----
Paiute-Washo	2	2	2	2	2	2	2	2	2	2	2	-----
Washo	20	11	9	20	11	9	1	1	1	1	1	-----
Nye County scattered Indians	369	187	182	369	187	182	1	1	1	1	1	-----
Paiute	29	13	13	29	16	13	1	1	1	1	1	-----
Shoshone	340	171	169	340	171	169	1	1	1	1	1	-----
Walker River Reservation	505	237	248	478	243	235	18	9	9	5	4	-----
Paiute	454	231	223	430	218	212	15	8	7	5	4	-----
Paiute	3	1	2	47	24	23	3	1	2	1	1	-----
Paiute-Washo	47	24	23	47	24	23	3	1	2	1	1	-----
Shoshone	2	2	2	2	2	2	2	2	2	2	2	-----
Washo	1	1	1	1	1	1	1	1	1	1	1	-----
Western Shoshone Agency and Reservation, see Idaho	509	268	241	433	230	203	69	35	34	7	3	-----
Hopi	1	1	1	1	1	1	1	1	1	1	1	-----
Hopi-Shoshone-Paiute	7	4	3	2	2	2	1	1	1	1	1	-----
Paiute	84	47	37	79	43	36	5	4	1	4	2	-----
Shoshone	249	115	115	207	112	95	40	21	19	2	1	-----
Shoshone-Paiute	167	82	85	145	73	72	22	9	13	1	1	-----
Shoshone-Washo	1	1	1	1	1	1	1	1	1	1	1	-----

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total
New Mexico ²												
Eastern Navajo Agency and Navajo Reservation (Navajo)	34,196	17,637	16,559		33,642	17,340	16,302		88	36	52	466
Jicarilla Agency and Reservation	7,879	3,938	3,941		7,879	3,938	3,941					261
Apache-Navajo	666	338	328		657	318	312		7	5	2	2
Apache-Pueblo	13	6	7		13	6	7		4	2	2	2
Apache-Pima	17	10	7		14	7	7		3	3		
Mescalero Agency and Reservation	718	352	366		703	341	362		5	3	2	10
Apache	714	351	363		700	340	360		4	3	1	8
Apache-Pima	2	1	1		2	1	1					
Apache-Pueblo	1								1			
Northern Navajo Agency and Navajo Reservation (Navajo)	8,424	4,339	4,085		8,424	4,339	4,085					
Santa Fe School Jurisdiction	2,160	1,098	1,062		2,046	1,047	999		36	11	25	78
Nambe Pueblo (Pueblo)	127	62	65		116	57	59		4	2	2	3
Picuris Pueblo (Pueblo)	113	54	59		103	51	52		5	5	3	3
Pojoaque Pueblo (Pueblo)	8	5	3		5	3	2		1	1		2
San Ildefonso Pueblo (Pueblo)	123	64	59		108	58	50		9	2	7	3
San Juan Pueblo (Pueblo)	546	275	271		509	256	253		8	5	3	29
San Juan Pueblo (Pueblo)	390	195	195		369	183	186		8	6	3	14
Santa Clara Pueblo	381	190	191		361	178	183		7	2	5	13
Pueblo									1		1	10
Pueblo-Apache	7	4	3		6	4	2					
Pueblo-Navajo	2	1	1		2	1	1					
Taos Pueblo (Pueblo)	733	380	353		717	377	340		2	2	2	14
Tesque Pueblo (Pueblo)	120	63	57		119	62	57					1
Southern Navajo Agency and Navajo Reservation, in Arizona (Navajo) ²	4,967	2,475	2,492		4,963	2,472	2,491		2	2		2
Southern Pueblos Agency	7,361	3,966	3,395		6,965	3,771	3,214		27	6	21	349
Acoma Pueblo	1,109	570	539		1,049	536	513					60
Pueblo	1,104	568	536		1,045	535	511					58
Pueblo-Chocoma	1				1	1						33
Pueblo-Navajo	4	3			2		2					1
Cochiti Pueblo	298	159	139		298	159	135					
Pueblo	295	158	137		295	158	137					
Pueblo-Hopi	2	1			2	1						
Pueblo-Zuni	1		1		1							

	1,057	593	494	1,060	576	494		27	17	10
Isleta Pueblo.	2	2						2	2	
Navajo-Pueblo.	1,082	589	493	1,059	575	484		23	14	9
Pueblo.	2	1	1					2	1	1
Pueblo-Navajo.	1									
Pueblo-Zuni.	658	356	302	652	353	299		5	2	3
Jemez Pueblo.	657	355	302	652	353	299		4	4	3
Pueblo.	1	1						1	1	1
Pueblo-Zuni.	2,226	1,165	1,061	1,992	1,028	994		1	1	1
Laguna Pueblo.	2,159	1,128	1,031	1,911	1,003	903		249	132	117
Pueblo.	10	5	5	4	3	1		233	123	110
Pueblo-Apache.	6	2	4	6	2	4		6	2	4
Pueblo-Chippewa.	8	2	6	2	1	1				
Pueblo-Hopi.	1		1							
Pueblo-Kikapoo.	2	2	1							
Pueblo-Maidu.	2	2	1							
Pueblo-Mission.	6	3	3	6	3	3				
Pueblo-Navajo.	18	11	7	15	9	6		2	2	1
Pueblo-Paiute.	1		1					1	1	
Pueblo-Papago.	2									
Pueblo-Seneca-Mohawk.	1									
Pueblo-Zuni.	12	9	3	6	5	1				
Sandia Pueblo (Pueblo).	123	66	57	118	64	54				
San Felipe Pueblo.	567	316	251	566	316	250				
Pueblo.	561	313	248	561	313	248				
Pueblo-Cherokee.	2	1	1	2	1	1				
Pueblo-Papago.	1	1	1	1	1	1				
Pueblo-Zuni.	3	1	1	2	1	1				
Santa Ana Pueblo (Pueblo).	245	146	99	245	146	99				
Santo Domingo Pueblo (Pueblo).	861	493	368	861	493	368				
Sia Pueblo (Pueblo).	187	102	85	184	100	84				
Zuni Agency and Pueblo.	2,021	1,131	890	1,985	1,101	884				
Hopi.	1	1	1	1	1	1				
Klamath.	1		1							
Navajo.	4		4	4		4				
Pima.	2		2							
Pueblo.	2,013	1,131	882	1,979	1,101	878				
North Carolina: Cherokee Agency and Reservation (Eastern Cherokee).	3,247	1,791	1,526	2,809	1,487	1,322				
North Dakota.	9,911	5,025	4,886	6,426	3,284	3,142				
Fort Berthold Agency and Reservation.	1,555	797	778	1,463	722	743				
Arikara.	505	250	253	470	236	234				
Arikara-Cheyenne.	1	4	4							
Arikara-Chippewa.	8			5	2	3				
Arikara-Gros Ventre.	12	1	12	12		12				
Arikara-Gros Ventre-Mandan.	2	1	1	2	1	3				
Arikara-Sioux.	5	2	3	5	2	3				
Gros Ventre.	638	317	321	623	308	315				

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled				Residing at another jurisdiction		Residing elsewhere	
	Total	Male	Female	Total	Male	Female	Sex not reported	Total	Male	Female	Total
North Dakota—Continued.											
Fort Berthold Agency and Reservation—Continued.											
Gros Ventre-Arapaho	1		1								1
Gros Ventre-Chippewa	8	5	3	8	5	3					
Gros Ventre-Mandan	17	8	9	17	8	9					
Gros Ventre-Sioux	12	6	6	10	5	5		2	1	1	
Gros Ventre-Winnebago	2	1	1								
Mandan	281	140	141	275	137	138		3	1	2	3
Mandan-Arikara	4	3	1	4	3	1					
Mandan-Chippewa	1		1	1		1					
Mandan-Gros Ventre	22	9	13	22	9	13					
Mandan-Sioux	16	11	5	11	6	5		5	5		
Fort Totten Agency and Devils Lake Reservation (Sioux)	972	502	470	890	461	429		39	19	20	43
Sisseton Agency and Lake Traverse or Sisseton Reservation, in South Dakota (Sioux)	48	29	19	48	29	19					
Standing Rock Agency and Reservation, see South Dakota (Sioux)	1,620	810	810	1,485	754	731		51	21	30	84
Turtle Mountain Agency and Reservation (Chippewa)	5,736	2,927	2,809	2,538	1,318	1,220		77	37	40	3,121
Oklahoma	22,064	11,081	10,983	16,447	8,326	8,121		594	302	292	5,023
Nebraska—Continued.											
Cheyenne and Arapaho Agency and Reservation (Cheyenne-Arapaho)											
Kiowa Agency	2,742	1,417	1,325	2,423	1,236	1,187		140	74	66	179
Kiowa Reservation	5,816	2,846	2,970	5,682	2,779	2,903		37	24	13	43
Apache	4,444	2,176	2,268	4,387	2,149	2,238		22	12	10	35
Apache-Comanche	311	166	145	309	164	145		1	1		1
Apache-Kiowa	2	1	1	2	1	1					
Comanche	13	7	6	13	7	6					
Comanche-Apache	1,995	977	1,018	1,967	966	1,001		4			21
Comanche-Caddo	13	7	6	13	7	6					
Comanche-Kiowa	8	5	3	8	5	3					
Kiowa	29	14	15	29	14	15					
Kiowa-Apache	2,032	979	1,053	2,005	965	1,040		17	11	6	10
Kiowa-Cheyenne	22	12	10	22	12	10					
Kiowa-Comanche	1	1	1	1	1	1					
	18	8	10	18	8	10					

	1,372	670	702	1,295	630	665	15	12	3	62	28	34
Wichita Reservation	1,372	670	702	1,295	630	665	15	12	3	62	28	34
Caddo	386	386	387	1,712	354	338	10	8	2	51	24	27
Caddo-Delaware	106	53	53	106	53	53	2	5	2	5		
Caddo-Wichita	112	51	51	112	51	61	11	11				
Delaware	24	13	11	24	13	11	13	13				
Delaware-Caddo	3	1	2	3	1	2	5	4	1	11	4	7
Delaware-Shawnee	346	163	183	330	155	175						
Wichita	1		1	1		1						
Wichita-Caddo	2	1	1	2	1	1						
Wichita-Delaware	1,817	1,799	1,799	1,978	1,045	933	5	2	3	1,573	770	803
Osage Agency and Reservation	3,556	1,817	1,799	1,978	1,045	933	4	2	2	1,535	752	783
Osage	3,392	1,741	1,651	1,853	987	866				7	5	2
Osage-Bannock	2		2	2		2						
Osage-Blackfeet	2		2	2		2						
Osage-Cayuse	4	2	2	2	1	1						
Osage-Cherokee	21	7	14	16	5	11						
Osage-Cheyenne	3	2	1	1	1							
Osage-Chippewa-Wyandotte	4	2	2									
Osage-Creek	2	1	1	1	1	1						
Osage-Delaware	1	1	1	2	1	1						
Osage-Iowa	1	1	1	1	1	1						
Osage-Kaw	9	5	4	4	3	1						
Osage-Kaw	3			3		3						
Osage-Navajo	14	5	9	12	5	7						
Osage-Omaha	6	3	3	5	2	3						
Osage-Otoe	2	1	1	2	1	1						
Osage-Pawnee	1	1	1									
Osage-Peoria	1	1	1									
Osage-Ponca	4	3	1	4	3	1						
Osage-Potawatomi	19	8	11	19	8	11						
Osage-Pueblo	19	12	7	17	10	7						
Osage-Quapaw	15	9	6	13	9	4	1		1	2	2	1
Osage-Sac and Fox	2	2	2	2	2	2						
Osage-Seneca	4	4	4	2	2	2						
Osage-Shawnee	3	2	1	3	2	1						
Osage-Shawnee	3	3	3	3	3	3						
Osage-Sioux	13	3	10	10	2	8				3	1	2
Osage-Wyandotte	1	1	1	1	1	1						
Pawnee Agency	2,971	1,501	1,470	2,358	1,206	1,152	192	97	95	421	198	223
Kaw	515	272	243	293	159	134	46	22	24	176	91	85
Kaw-Chickasaw	372	197	175	202	109	93	36	21	15	134	67	67
Kaw-Cherokee	6	4	2	2	2		4	2	2	4	2	2
Kaw-Cheyenne	1	1	1	1			1	1	1	1	1	1
Kaw-Chickasaw	1	1	1	1			1	1	1	1	1	1
Kaw-Creek	9	4	5	4	3	1	1	1	1	4	1	3
Kaw-Oneida	9	3	6	8	3	5	1	1	1	2	2	2
Kaw-Osage	2	2	2									
Kaw-Osage-Potawatomi	3	3	3	3	3							
Kaw-Ponca	99	50	49	69	37	32	8	1	7	22	12	10
Kaw-Potawatomi	5	3	2	4	2	2						
Kaw-Potawatomi-Cherokee	6	4	2	1								
Kaw-Shawnee												

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female
Oregon—Continued.														
Grand Ronde Reservation—Continued.														
Lakmiut.....	4	3	1	—	2	2	—	—	2	1	1	—	—	—
Mary's River.....	21	13	8	—	21	13	8	—	—	—	—	—	—	—
Mary's River-Shasta.....	4	2	2	—	4	2	2	—	—	—	—	—	—	—
Molala.....	5	2	3	—	4	1	3	—	—	—	—	—	—	—
Rogue River.....	40	24	16	—	33	19	14	—	7	5	2	1	1	—
Rogue River-Santiam-Umpqua.....	3	1	2	—	3	1	2	—	—	—	—	—	—	—
Rogue River-Shasta.....	11	8	3	—	11	8	3	—	—	—	—	—	—	—
Rogue River-Upper Chinook.....	3	1	2	—	3	1	2	—	—	—	—	—	—	—
Santiam.....	13	8	5	—	10	5	5	—	—	—	—	3	3	—
Santiam-Rogue River.....	5	1	4	—	5	1	4	—	—	—	—	—	—	—
Santiam-Tulatin.....	3	3	—	—	—	—	—	—	—	—	—	3	—	3
Santiam-Umpqua.....	11	7	4	—	9	6	3	—	—	—	—	2	1	1
Shasta.....	19	13	6	—	16	10	6	—	3	3	—	—	—	—
Shasta-Santiam.....	1	1	—	—	1	—	—	—	—	—	—	—	—	—
Shasta-Umpqua.....	6	2	4	—	6	2	4	—	—	—	—	—	—	—
Umpqua.....	55	25	30	—	43	19	24	—	—	—	—	12	6	6
Umpqua-Gallice Creek.....	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Umpqua-Rogue River.....	3	2	1	—	3	2	1	—	—	—	—	—	—	—
Upper Chinook.....	8	3	5	—	6	2	4	—	1	—	—	1	1	—
Wapato.....	17	10	7	—	14	9	5	—	2	1	1	—	—	—
Wapato-Umpqua.....	1	1	—	—	1	1	—	—	—	—	—	—	—	—
Wasco.....	2	1	1	—	—	—	—	—	—	—	—	2	—	—
Siletz Reservation.....	461	234	227	—	424	216	208	—	8	3	5	2	15	14
Alsea.....	8	5	3	—	6	3	3	—	—	—	—	2	2	—
Calapooya.....	10	4	6	—	5	3	2	—	—	—	—	—	—	—
Chastacosta.....	30	12	18	—	30	12	18	—	4	—	4	1	—	—
Chastacosta-Cowlitz.....	3	2	1	—	3	2	—	—	—	—	—	—	—	—
Chelico.....	11	5	6	—	11	5	6	—	—	—	—	—	—	—
Chelico-Klamath.....	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Chelico-Kikitat.....	5	3	2	—	5	3	2	—	—	—	—	—	—	—
Coquille.....	8	5	3	—	7	4	3	—	—	—	—	—	—	—
Dakubetede.....	13	5	8	—	12	4	8	—	—	—	—	1	1	—
Gallice Creek.....	21	10	11	—	21	10	11	—	—	—	—	—	—	—
Gallice Creek-Umpqua.....	15	7	8	—	15	7	8	—	—	—	—	—	—	—
Gallice Creek-Wapato.....	2	2	—	—	2	2	—	—	—	—	—	—	—	—
Gallice Creek-Yuchi.....	4	2	2	—	4	2	2	—	—	—	—	—	—	—

Joshua.....	19	8	11	15	6	9	1	1	3	1	2
Joshua-Chetco.....	13	8	5	13	8	5					
Joshua-Chisop.....	3	1	2	3	1	2					
Joshua-Dakubede.....	1		1	1		1					
Joshua-Piegan.....	2	2		2	2				1	3	1
Joshua-Smith River.....	1	1									
Klamath.....	48	32	16	44	29	15			4		
Klamath-Rogue River.....	2	1	1	2	1	1	1		1		1
Klikitat.....	4	2	2	2	1	1			1		1
Kusa.....	9	4	5	8	4	4					
Kusa-Chastacosta.....	3	2	1	3	2	1			1		1
Kwatami.....	11	8	3	10	8	2			1		1
Kwatami-Umpqua.....	8	3	5	8	3	5			5	2	3
Meguenodon.....	35	21	14	30	19	11					
Meguenodon-Hoopa.....	7	2	2	7	2	5			1		
Meguenodon-Kusa.....	2	1	1	2	1	1					
Meguenodon-Shasta.....	7	2	1	2	1	7					
Meguenodon-Yuchi.....	1		7	7		7					
Naltunnetunne.....	1	1	2	1	1	2					
Naltunnetunne-Kusa.....	3	1	2	5	3	1					
Rogue River.....	28	1	23	47	26	21	1	1	3	1	2
Salmon River.....	1	1		1	1						
Salmon River-Meguenodon.....	2	1		2	2						
Shasta.....	2	1	1	2	1	1					
Shasta-Chastacosta.....	6	5	2	6	5	1					
Smith River.....	4	2	2				1	1	3	1	2
Tillamook.....	1		2	1		1					
Tutuini.....	1		1	1							
Tutuini-Chetco.....	45	17	28	45	17	28					
Tutuini-Umpqua.....	7	3	4	7	3	4					
Umpqua.....	14	6	8	14	6	8					
Yaquina.....	2	2		2	2						
Yaquina-Alsea.....	3	2		3	2						
Yuchi.....	6	1	5	6	1	5					
Unknown.....	2		2						2		2
Fourth Section Allottees (Public Domain)	327	172	155	311	164	147	8	7	1	8	1
Calapooya.....	5	4		5	4						
Cherokee.....	17	11	6	17	11	6					
Cowlitz.....	1										
Cowlitz-Klamath.....	4	2	2	4	2	2					
Klamath.....	51	25	26	43	21	22	3	3		5	4
Klamath-Kusa.....	39	27	32	58	26	32	1	1			
Kusa.....	1		1	1		1					
Mission.....	1		30	67	37	30			1		1
Rogue River.....	68	37	31								
Rogue River-Mission.....	3	1	2	3	1	2					
Suslaw.....	10	7	3	10	7	3					
Spokane.....	4	3	1	4	3	1					
Tutuini.....	17	6	11	17	6	11					
Tutuini-Kusa.....	1	1		1	1						

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933.—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female
Oregon—Continued.														
Fourth Section Allottees (Public Domain)—Continued.														
Umpqua.....	42	25	17	—	38	22	16	—	3	3	—	1	—	1
Upper Chinook.....	1	1	—	—	1	1	—	—	—	—	—	—	—	—
Unknown.....	43	21	22	—	41	21	20	—	1	—	—	—	—	1
Umatilla Agency and Reservation	1,129	529	600	—	747	365	382	—	134	65	69	248	99	149
Cayuse.....	128	53	75	—	104	43	61	—	12	8	4	12	2	10
Cayuse-Colville.....	13	6	7	—	13	6	7	—	—	—	—	—	—	—
Cayuse-Colville-Palcos.....	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Cayuse-Colville-Tenino (Warm Springs).....	1	—	1	—	1	—	1	—	1	—	—	—	—	—
Cayuse-Flathead.....	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Cayuse-Nez Perce.....	42	21	21	—	29	15	14	—	1	1	—	—	—	—
Cayuse-Nez Perce-Cree.....	3	2	1	—	3	2	1	—	—	—	—	—	—	—
Cayuse-Nez Perce-Flathead.....	2	1	1	—	—	—	—	—	2	1	1	—	—	—
Cayuse-Nez Perce-Yakima.....	4	4	—	—	4	4	—	—	—	—	—	—	—	—
Cayuse-Umatilla.....	32	15	17	—	30	13	17	—	1	1	—	1	1	—
Cayuse-Umatilla-Nez Perce.....	25	14	11	—	18	12	6	—	7	2	5	—	—	—
Cayuse-Umatilla-Nez Perce-Sac and Fox.....	2	—	2	—	—	—	—	—	2	—	2	—	—	—
Cayuse-Umatilla-Walla Walla.....	10	6	4	—	10	6	4	—	—	—	—	—	—	—
Cayuse-Umatilla-Walla Walla-Nez Perce.....	7	5	2	—	6	5	1	—	1	—	—	—	—	—
Cayuse-Umatilla-Walla Walla-Palcos.....	3	1	2	—	3	1	2	—	—	—	—	—	—	—
Cayuse-Umatilla-Yakima.....	3	1	2	—	3	1	2	—	—	—	—	—	—	—
Cayuse-Walla Walla.....	50	23	27	—	46	23	23	—	3	3	—	—	—	—
Cayuse-Walla Walla-Colville.....	3	1	—	—	3	1	—	—	—	—	—	—	—	—
Cayuse-Walla Walla-Nez Perce.....	5	—	5	—	2	—	—	—	—	—	—	—	—	—
Cayuse-Walla Walla-Nez Perce-Colville.....	3	1	2	—	3	1	2	—	3	—	3	—	—	—
Cayuse-Walla Walla-Yakima.....	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Cayuse-Wasco-Tenino (Warm Springs).....	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Cayuse-Yakima.....	24	7	17	—	18	7	11	—	—	—	—	1	1	1
Nez Perce.....	12	3	9	—	10	3	7	—	5	—	5	1	—	1
Palcos.....	4	1	3	—	4	1	3	—	2	—	2	—	—	—
Tenino (Warm Springs).....	1	1	—	—	1	1	—	—	—	—	—	—	—	—
Umatilla.....	75	27	48	—	62	22	40	—	5	3	2	8	2	6
Umatilla-Klikitat.....	4	2	2	—	2	2	—	—	2	—	2	—	—	—
Umatilla-Nez Perce.....	19	7	12	—	16	6	10	—	3	1	2	—	—	—
Umatilla-Palcos.....	1	—	1	—	1	—	1	—	—	—	—	—	—	—
Umatilla-Palcos-Yakima.....	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Umatilla-Tenino (Warm Springs).....	3	2	1	—	3	2	1	—	—	—	—	—	—	—

Umatilla-Yakima.....	15	7	8		14	6	8	1	1	1	18	205	86	119
Walla Walla.....	525	202	263		273	147	126	47	29	1	2	2		
Walla Walla-Calapooya.....	2	2												
Walla Walla-Cherokee.....	3	1	2		3	1	2							
Walla Walla-Colville.....	29	15	14		8	7	1	12	6	6	9	2	2	7
Walla Walla-Flathead.....	4	3	1					2	2	2	2	1		1
Walla Walla-Klikitat.....	3	1	2		3	1	2							
Walla Walla-Nez Perce.....	4	3	1		2	2		2	1	1	1			
Walla Walla-Nez Perce-Flathead.....	1		1					1	1	1	1			
Walla Walla-Palcos.....	4	4	4		7	4	3							
Walla Walla-Stout.....	5	3	2		5	3	2							
Walla Walla-Umatilla.....	23	11	12		18	9	9					5	2	3
Walla Walla-Yakima.....	22	9	13		18	7								
Yakima.....	1													
990.....	444	516			558	407	451	79	43	36	1	53	24	29
Warm Springs Agency and Reservation														
Cowlitz.....	3	2	3		1	1		5	2	1	3			
Klamath-Pit River-Wasco.....	3	2												
Klikitat.....	27	11	16		26	11	15	1		1				
Klikitat-Yakima.....	1	1												
Paute.....	192	103	89		149	77	72	35	20	15	8	6	2	
Paute-Blackfeet.....	1		1		1		1							
Paute-Tenino (Warm Springs).....	1	4	4		7	4	3	1		1				
Paute-Wasco.....	8	5	3		4	3	1	4	2	2				
Paute-Yakima.....	4		1		4	3	1							
Pit River.....	1	1			1	1								
Pit River-Puyallup.....	9	5	4		4	3	1	1	4	1	4	2	2	
Pit River-Puyallup-Hoopla.....	3	1	2		3	1	2							
Pit River-Puyallup-Paute.....	3	1	2		6	4	2							
Pit River-Wasco.....	6	4	2		2	2								
Pit River-Wasco-Shasta.....	2		3		4	1	3							
Pit River-Yakima.....	4	1			2	2		2	2					
Puyallup.....	2	2												
Puyallup-Wasco-Pit River.....	4	1	3				3							
Puyallup (Warm Springs).....	439	189	250		4	1	233	14	8	6	16	5	11	
Tenino (Warm Springs).....	1		1		409	176	1							
Tenino (Warm Springs)-Klikitat.....	1				1		1							
Tenino (Warm Springs)-Nez Perce-Wasco.....	1	1	1											
Tenino (Warm Springs)-Siletz.....	1													
Tenino (Warm Springs)-Umatilla.....	6	4	2		4	3	1	2	1	1				
Tenino (Warm Springs)-Upper Chinook.....	4				4	4								
Tenino (Warm Springs)-Wasco-Paute.....	4	3	1		4	3	1							
Tenino (Warm Springs)-Wasco-Yakima.....	4	3	5		7	5	6							
Tenino (Warm Springs)-Yakima.....	11	5	6		11		1							
Tenino (Warm Springs)-Yakima-Klikitat.....	1		1		1		2							
Upper Chinook.....	4	2	2		4	2	2							
Wasco.....	99	47	52		75	36	39	8	4	4	10	3	7	9
Wasco-Puyallup.....	4	3	1											
Wasco-Tenino (Warm Springs).....	4	3			46		47							
Wasco-Tenino (Warm Springs)-Klamath.....	99	49	50		93	46		3	2	1	3	1	3	2
	1	1			1									

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total
Oregon—Continued.												
Warm Springs Agency and Reservation—Continued.												
Wasco-Tenino (Warm Springs)-Umatilla	4	3	1		4	3	1					
Wasco-Tenino (Warm Springs)-Upper Chinook	3	2	1		3	2	1					
Wasco-Umatilla	1	1			1	1						
Wasco-Tenino (Warm Springs)-Upper Chinook	2	1	1		2	1	1					
Wasco-Upper Chinook	5	3	2		3	3						
Wasco-Yakima	7	3	4		7	3	4					
Yakima	4	3	1		4	3	1					
Unknown	3	2	1		3	2	1					
South Dakota	26,593	13,566	12,992		22,880	11,747	11,133		1,027	506	521	
Cheyenne River Agency and Reservation												
Cheyenne	3,235	1,677	1,558		2,724	1,423	1,301		249	127	122	
Sioux	3,214	1,664	1,550		2,704	1,411	1,293		248	126	122	
Sioux-Chippewa	14	6	8		14	6	8					
Sioux-Chocataw	2	2			2	2						
Sioux-Creek	1	1			1	1						
Sioux-Shawnee	3	3			3	3						
Sioux-Yuma	1	1			1	1						
Crow Creek Agency	1,556	776	780		1,247	623	624		117	50	67	
Crow Creek Reservation (Sioux)	932	457	495		823	394	429		37	16	21	
Lower Brule Reservation (Sioux)	604	319	285		424	229	195		80	34	46	
Flandreau School Jurisdiction and Purchased Lands (Sioux)												
Pine Ridge Agency and Reservation	334	178	156		159	94	65		39	20	19	
Sioux	8,294	4,245	4,049		7,723	3,985	3,738		102	45	57	
Arapaho-Sioux	2	1	1		2	1						
Cherokee-Sioux	3	1	2		3	1	2					
Crow-Sioux	7	3	4		7	3	4					
Menominee-Sioux	3	2	1		3	2	1					
Onaida-Sioux	8	5	3		8	5	3					
Ponca-Sioux	5	3	2		5	3	2					
Sioux	8,184	4,191	3,993		7,660	3,952	3,708		88	38	50	
Sioux-Arapaho	5	3	2		5	3	2					
Sioux-Cherokee	16	9	7		15	8	7					
Sioux-Cheyenne	20	10	10		19	9	10					
Sioux-Chippewa	6	3	3		6	3	3					
Sioux-Crow	1	1			1	1						
Sioux-Hopi	3	1	2		3	1	2					
Sioux-Iroquois	2	1	1		2	1	1					

[illegible]

For footnotes see p. 141.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population				Residing at jurisdiction where enrolled				Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female
Washington—Continued.														
Neah Bay Agency	410	219	191	—	337	184	153	—	2	—	2	71	35	36
Makah Reservation (Makah)	408	217	191	—	335	182	153	—	2	—	2	71	35	36
Ozette Reservation (Makah)	2	2	—	—	2	2	—	—	—	—	—	—	—	—
Taholah Agency ⁸	2, 035	1, 021	1, 014	—	1, 020	533	487	—	32	11	21	983	477	506
Chehalis Reservation (Chehalis) ¹⁰	28	21	7	—	18	15	3	—	—	—	—	10	6	4
Nisqually Reservation (Nisqually)	62	36	26	—	52	32	20	—	—	—	—	10	4	6
Quinalt Reservation ^{9 10}	1, 725	855	870	—	764	390	374	—	27	9	18	934	456	478
Chehalis	69	32	37	—	35	14	21	—	—	—	—	54	18	16
Chehalis-Cherokee	3	2	1	—	—	—	—	—	—	—	—	3	2	1
Chehalis-Cowlitz	1	—	1	—	1	—	1	—	—	—	—	—	—	—
Chehalis-Dwamish	4	4	—	—	—	—	—	—	—	—	—	4	4	—
Chehalis-Nisqually	6	1	5	—	6	1	5	—	—	—	—	—	—	—
Chehalis-Nisqually-Puyallup	7	4	3	—	7	4	3	—	—	—	—	—	—	—
Chehalis-Puyallup	1	1	—	—	1	—	—	—	—	—	—	—	—	—
Chehalis-Quinalt	3	2	1	—	—	—	—	—	—	—	—	—	—	—
Chehalis-Skokomish	6	6	—	—	1	1	—	—	—	—	—	3	2	1
Chehalis-Snohomish	4	—	4	—	—	—	—	—	—	—	—	5	5	—
Cowlitz	19	8	11	—	1	—	1	—	—	—	—	15	6	9
Dwamish-Snoqualmu	1	—	1	—	4	2	2	—	—	—	—	—	—	—
Hoh	3	—	3	—	1	1	—	—	—	—	—	—	—	—
Quileute	3	—	—	—	2	—	—	—	—	—	—	—	—	—
Quileute-Clallam	244	131	113	—	231	124	107	—	7	3	4	6	4	2
Quileute-Makah	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Quileute-Puyallup	14	2	12	—	1	—	1	—	—	—	—	1	1	—
Quileute-Tulalip	10	6	4	—	—	—	—	—	12	2	10	10	6	4
Quinalt	2	1	1	—	2	1	1	—	—	—	—	—	—	—
Quinalt-Chehalis	850	419	431	—	421	211	210	—	4	2	2	425	206	219
Quinalt-Chehalis-Puyallup	13	5	8	—	8	3	5	—	—	—	—	5	2	3
Quinalt-Clatsop	9	7	2	—	—	—	—	—	—	—	—	9	7	2
Quinalt-Cowlitz	2	—	2	—	—	—	—	—	—	—	—	—	—	—
Quinalt-Dwamish	15	9	6	—	4	2	2	—	—	—	—	11	7	4
Quinalt-Puyallup	2	1	1	—	—	—	—	—	—	—	—	2	1	1
Quinalt-Dwamish	2	—	—	—	—	—	—	—	—	—	—	—	—	—
Quinalt-Dwamish-Yakima	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Quinalt-Makah	2	—	2	—	—	—	—	—	—	—	—	—	—	—
Quinalt-Nisqually	8	3	5	—	—	—	—	—	—	—	—	—	—	—
Quinalt-Nisqually	3	1	2	—	—	—	—	—	4	2	2	4	1	3
Quinalt-Paite	3	2	1	—	1	1	—	—	—	—	—	3	2	1
Quinalt-Quileute	16	10	6	—	14	9	5	—	—	—	—	2	1	1

Quinalt-Skokomish.....	10	5	5	6	5	1	1	4	4	4
Quinalt-Snoqualm.....	3	2	1	3	2	2	1	3	2	1
Quinalt-Squaxin.....	5	3	2	3	2	1	1	247	125	122
Quinalt-Upper Chinook.....	249	126	123	2	1	1	1	3	2	1
Quinalt-Yakima.....	9	6	3	6	4	2	4	92	38	54
Upper Chinook.....	93	39	54	1	1	1	1	9	3	6
Upper Chinook-Chehalis.....	9	3	6	6	6	1	1	3	1	2
Upper Chinook-Chehalis-Quinalt.....	3	1	2	1	1	1	1	21	9	12
Upper Chinook-Cowlitz.....	22	10	12	1	1	1	1	21	9	12
Skokomish Reservation.	181	89	92	156	81	75	4	21	7	14
Clallam.....	1	1	1	1	1	1	1	3	7	14
Skokomish.....	180	88	92	155	80	75	4	21	7	14
Squaxin Island Reservation (Squaxin)	39	20	16	30	15	15	1	8	4	4
Tulalip Agency.	3,869	1,714	1,655	1,966	996	970	16	1,987	713	674
Lummi Reservation.	621	318	303	506	254	252	1	115	64	51
Lummi.....	596	310	286	481	246	235	7	115	64	51
Lummi-Chippewa.....	7	3	4	7	3	4	7	3	1	1
Lummi-Clallam.....	6	1	5	6	1	1	1	3	1	2
Lummi-Colville.....	1	1	1	1	1	1	1	3	1	2
Lummi-Snomish.....	5	5	4	5	2	3	1	11	5	11
Lummi-Swinomish.....	5	2	3	5	2	3	1	11	5	11
Lummi-Yakima.....	1	1	1	1	1	1	1	1	1	1
Muckleshoot Reservation.	190	87	103	179	82	97	3	8	4	4
Muckleshoot.....	164	75	89	153	70	83	3	8	4	4
Muckleshoot-Puyallup.....	7	3	4	7	3	4	3	8	4	4
Muckleshoot-Suquamish.....	1	1	1	1	1	1	1	1	1	1
Port Madison Reservation.	18	8	10	18	8	10	1	15	5	10
Muckleshoot-Yakima.....	163	84	79	147	79	68	1	15	5	10
Muckleshoot-Suquamish.....	148	77	71	132	72	60	1	15	5	10
Suquamish.....	3	1	2	3	1	2	1	1	1	1
Suquamish-Clallam.....	1	5	6	11	5	6	1	1	1	1
Suquamish-Puyallup.....	1	1	1	1	1	1	1	1	1	1
Suquamish-Snomish.....	1	1	1	1	1	1	1	1	1	1
Puyallup Reservation.	394	151	153	24	12	12	1	280	139	141
Puyallup.....	293	147	146	22	12	10	1	271	135	136
Puyallup-Muckleshoot.....	3	2	3	3	2	2	1	3	2	1
Puyallup-Snomish.....	4	1	3	2	2	2	1	4	1	3
Puyallup-Suquamish.....	4	1	3	2	2	2	1	4	1	3
Swinomish Reservation.	273	136	137	266	132	134	7	7	4	3
Muckleshoot.....	1	1	1	1	1	1	1	7	4	3
Suquamish.....	1	1	1	1	1	1	1	7	4	3
Swinomish.....	253	133	120	246	129	117	1	7	4	3
Swinomish-Clallam.....	2	2	2	2	2	2	2	2	2	2
Swinomish-Lummi.....	2	2	2	2	2	2	2	2	2	2
Swinomish-Muckleshoot.....	7	7	7	7	7	7	7	7	7	7
Swinomish-Skagit.....	4	4	4	4	4	4	4	4	4	4
Swinomish-Upper Chinook.....	3	2	1	3	2	1	1	3	2	1

For footnotes see p. 141.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction		Residing elsewhere		
	Total	Male	Female	Sex not reported	Total	Male	Female	Sex not reported	Total	Male	Female
Washington—Continued.											
Tulalip Agency—Continued.											
Tulalip Reservation and Tulalip unattached Indians	644	313	331		444	218	226		192	93	99
Challam.....	4	3	1						4	3	1
Skagit.....	1	1							1		
Snohomish.....	508	273	295		388	191	197		172	80	92
Snohomish-Challam.....	14	7	7		7	3	4		7	4	3
Snohomish-Lummi.....	4	3	1						4	3	1
Snohomish-Makah.....	1		1								
Snohomish-Nooksak.....	3	2	1		1		1				
Snohomish-Paute.....	1	1			3	2	1				
Snohomish-Puyallup.....	6	2	4		1	1					
Snohomish-Puyallup-Suquamish.....	2	1	1		6	2	4				
Snohomish-Skagit.....	2	1	1		2	1	1				
Snohomish-Suquamish.....	5	3	2		5	3	2				
Snohomish-Swinomish.....	12	7	5		8	5	3				
Snohomish-Yakima.....	3	2	1		3	2	1		4	2	2
Suquamish.....	19	8	11		19	8	11				
Public Domain (Challam)	761	399	362		1	1	1				
Challam.....	744	392	352						761	399	362
Challam-Lummi.....	1								744	392	352
Challam-Makah.....	3	1	2						1		1
Challam-Puyallup.....	1								3	1	2
Challam-Snohomish.....	3	2	1						1		1
Challam-Suquamish.....	9	4	5						3	2	1
Public Domain (Nooksak)	207	110	97		202	107	95		5	3	2
Nooksak.....	205	110	95		200	107	93		5	3	2
Nooksak-Skagit.....	2				2		2		5	3	2
Public Domain (Skagit)	206	116	90		198	112	86				
Skagit.....	200	111	89		195	109	86		4	2	2
Skagit-Makah.....	3	3	1						1	1	1
Skagit-Snohomish.....	3				3				3	2	1
Yakima Agency and Reservation (Yakima)	2,954	1,383	1,541		2,384	1,129	1,255		42	17	25
									498	237	261

Wisconsin "	11, 139	5, 615	5, 524	9, 132	4, 644	4, 488	373	171	202	1, 634	800	834
Hayward School Jurisdiction and Lac Courte Oreille Reservation (Chippewa)	1, 538	760	778	1, 454	717	737	4	4		80	39	41
Keshena Agency "	5, 101	2, 581	2, 520	4, 090	2, 117	1, 973	197	85	112	814	379	435
Menominee Reservation	2, 023	1, 028	895	1, 894	978	916	19	7	12	110	43	67
Menominee	1, 820	929	891	1, 715	892	823	14	4	10	91	33	58
Menominee-Chippewa	43	22	21	39	21	18	3	1	2	1		1
Menominee-Creek	3	1	2	3		12						
Menominee-Oneida	37	21	16	37	21	16						
Menominee-Oneida-Chippewa	4	1	3	4	1	3						
Menominee-Ottawa	13	7	6	13	7	6						
Menominee-Ottawa-Potawatomi	3	1	2	3	1	2				1		1
Menominee-Potawatomi	30	15	15	29	15	14				1		1
Menominee-Shawnee	1		1							1		1
Menominee-Sioux	5	1	4	5	1	4						
Menominee-Sioux-Winnebago	1		1									
Menominee-Stockbridge	48	24	24	34	14	20	2	2		12	8	4
Menominee-Winnebago	13	6	7	9	4	5				4	2	2
Menominee-Winnebago-Chippewa	1		1	1		1						
Menominee-Wyandotte	1		1									
Oneida Reservation	3, 078	1, 553	1, 525	2, 196	1, 139	1, 057	178	78	100	704	336	368
Oneida	2, 947	1, 493	1, 454	2, 136	1, 115	1, 021	145	61	84	666	317	349
Oneida-Brotherton	21	7	14	6		6				15	7	8
Oneida-Cherokee	2	1	1	1			2	1	1	16	8	8
Oneida-Chippewa	34	19	15	9	6	3	9	5	4	1	1	
Oneida-Choctaw	3	2	1	1			2	1	1			
Oneida-Klamath	2	1	1									
Oneida-Menominee	5	3	2	5	3	2						
Oneida-Mohawk	5	3	2	5	3	2						
Oneida-Omaha	1		1	1			1	1	1			
Oneida-Pima	2	1	1				2	1	1			
Oneida-Ponca	1		1	1			1					
Oneida-Pueblo	4	3	1							4	3	1
Oneida-Sioux	3	1	2									
Oneida-Stockbridge	35	12	23	35	12	23	3	1	2			
Oneida-Wyandotte	13	7	6				11	7	4	2		2
Lac du Flambeau Agency "	3, 093	1, 575	1, 518	2, 397	1, 214	1, 183	36	22	14	660	339	321
Bad River Reservation (Chippewa)	1, 211	627	584	733	383	350	27	16	11	451	228	223
Lac du Flambeau Reservation (Chippewa)	849	399	450	757	353	404				92	46	46
Red Cliff Reservation (Chippewa)	607	316	291	491	252	239	416	6	3	116	64	52
Scattered bands	426	233	193	416	226	190	9	6	3	1	1	
Potawatomi-Chippewa	403	224	179	393	217	176	9	6	3	1	1	
Potawatomi-Chippewa	2		2	2								
Potawatomi-Ojibwa	6	3	3	9	6	3						
Potawatomi-Winnebago	12	3	9	12	3	9						
Tomah School Jurisdiction and Public Domain Allotments (Winnebago)	1, 407	699	708	1, 191	596	595	136	60	76	80	43	37

For footnotes see p. 144.

Table 2.—Indian population in continental United States enumerated at Federal agencies according to tribe, sex, and residence Apr. 1, 1933—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction		Residing elsewhere	
	Total	Male	Female	Sex not reported	Total	Male	Female	Total	Male	Female
Wyoming										
Shoshone Agency and Wind River or Shoshone Reservation	2, 115	1, 090	1, 025	---	1, 881	983	898	50	26	24
Arapaho	2, 115	1, 090	1, 025	---	1, 881	983	898	50	26	24
Arapaho-Shoshone	1, 024	531	493	---	984	513	471	13	7	6
Arapaho-Gros Ventre	5	3	2	---	5	3	2	---	---	---
Arapaho-Sioux	4	2	2	---	---	---	---	---	---	---
Shoshone	3	1	2	---	3	1	2	---	---	---
Shoshone-Arapaho	1, 030	523	507	---	861	449	412	33	16	17
Shoshone-Bannock	9	5	4	---	6	3	3	1	1	---
Shoshone-Comanche	7	5	2	---	6	4	2	1	1	---
Shoshone-Flathead	3	2	1	---	---	---	---	---	---	---
Shoshone-Navajo	5	2	3	---	3	1	2	2	1	1
Shoshone-Paiute	7	4	3	---	---	---	---	---	---	---
Shoshone-Seminole-Wyandotte	3	2	1	---	---	---	---	---	---	---
Shoshone-Ute	3	2	1	---	3	2	1	---	---	---
Shoshone-Yakima	10	7	3	---	10	7	3	---	---	---
	2	1	1	---	---	---	---	2	1	1

¹ See estimated statement of other Indians not enumerated numbering 88,700.² Formerly the entire population of Southern Navajo Agency was reported under Arizona, which accounts for the large decrease in the population of Arizona and the unusual increase in New Mexico.³ Apr. 1, 1932, population.⁴ Apr. 1, 1930, population.⁵ Tularie County Indians prior to 1932 returned under Tule River Reservation.⁶ Apr. 1, 1931, population.⁷ Exclusive of Five Civilized Tribes. (See estimated statement.)⁸ Over 600 additional Indians were enrolled during the year at Quinalt Reservation, Tabolah Agency, hence the unusual increase in population.⁹ Exclusive of scattered bands under Tabolah Agency. (See estimated statement.)¹⁰ Some of the Indians formerly enrolled on the Chehalis Reservation are now enrolled on the Quinalt Reservation.¹¹ Exclusive of Stockbridge Reservation, Keshena Agency, and Rice Lake Band of Chippewas, Lac du Flambeau Agency. (See estimated statement.)

Table 3.—Indian school population and school enrollment during fiscal year ended June 30, 1933

[NOTE.—In column 12 are included a considerable number of children believed to be in public schools away from reservations. Column 13 includes ineligible. The figure given in column 2 for Navajos under the Hopi Agency is an estimate based on the proportion of children to total population in other Arizona Navajo jurisdictions]

State and jurisdiction	Indian children 6 to 18 years, inclusive	Enrollment, 6 to 18 years of age							Under 6 and over 18 years enrolled in all schools	6 to 18 years of age		
		Total number	In local public	In Federal day	In Federal reservation boarding	In Federal non-reservation boarding	In mission, private and State day	In mission, private and State boarding		In sanatoria	Definite information not available	Not enrolled in any school
1	2	3	4	5	6	7	8	9	10	11	12	13
Total	100,678	76,096	43,988	6,315	9,805	7,426	1,764	6,200	598	2,749	12,520	12,062
Arizona	15,238	8,325	559	1,953	2,386	1,650	806	900	71	606	4,131	2,802
Colorado River:												
Chimeneviri	71	69	40		20	9				2		2
Mohave	195	186	65		84	32		4	1	12	6	3
Fort Apache	837	739	26	62	396	56	141	45	13	73		98
Havasupai	58	56		38	12	6				2		2
Hopi:												
Hopi	745	722	48	402	1	240		31		49		23
Navajo	1,400	400	1		220	176		3		9		1,000
Kaibab (under Paiute)	26	21	3	13		5						5
Leupp	669	388	13		319	54		2		39		281
Phoenix:												
Camp Verde	100	56	29		18		7	1	1	6	18	26
Salt River	395	311	51	148	2	79		20	11	50		84
Pima	1,469	1,009	39	585		114	78	168	25	82	460	
San Carlos	2	696	2	204	107	23	161	25				174
Sells	1,568	1,021	62	320	24	127	354	134			517	
Southern Navajo	5,174	2,074	166	126	769	474	65	406	8	205	3,100	
Truxton Canon	110	99	3		84	11		1				
Western Navajo:												
Hopi	118	118	4	55		59				3		
Navajo	1,027	534	7		330	185				76		1,093
California	4,609	4,691	3,100	303	98	513	4	57	16	227	134	394
Bishop (under Walker River, Nev.)	404	318	244	6	45	68				45	61	25
Fort Yuma	196	160	16	114	28	18	2			18	36	
Hoopa Valley	1,261	1,081	862	68		147			4	24	12	168
Mission	683	604	354	93	98		2	51	6	37		76
Sacramento	2,065	1,928	1,624	22		270			6	103	51	86
Colorado: Consolidated Ute	192	151	64		68	15		3	1	12	1	40
Florida: Seminole	175	14		14						6		161

Table 3.—Indian school population and school enrollment during fiscal year ended June 30, 1933—Continued

State and jurisdiction	Indian children 6 to 18 years, inclusive	Enrollment, 6 to 18 years of age							Under 6 and over 18 years enrolled in all schools	6 to 18 years of age		
		Total number	In local public	In Federal day	In Federal reservation boarding	In mission, private and State day boarding	In mission, private and State boarding	In sanatoria		Definite information not available	Not enrolled in any school	
1	2	3	4	5	6	7	8	9	10	11	12	13
Idaho	1,103	868	407		244	80	1	132	4	17	83	152
Coeur d'Alene	248	209	102			13	1	89	4			39
Fort Hall	533	420	139		244	37				17		113
Fort Lapwai	322	239	166					43				
Iowa: Sac and Fox	121	98	18	52		21			7	10	83	9
Kansas	558	252	152	17		78		1	4		217	89
Sac and Fox	19	4	2			2		15				
Potawatomi	248	164	102	5		52		1	4		37	47
Iowa	171					11					160	
Kickapoo	120	73	48	12		13					5	42
Minnesota	4,637	4,223	2,990	70	311	561		260	31	77	288	146
Consolidated Chippewa	4,088	3,724	2,835	70	24	511		255	29	50	246	118
Pipestone	100	92	79			13						
Red Lake	469	407	76		287	37		5	2	27	42	8
Mississippi: Choctaw	562	302		293		9						
Montana	4,531	3,968	2,582	195	345	322	80	406	38	214	111	225
Blackfeet	1,255	1,057	698	33	132	102		72	20		35	452
Crow	560	564	469			40		38	15	20		198
Flathead	957	805	517		6	103		42	2			26
Fort Belknap	397	329	158			16		53	1	41	37	115
Fort Peck	705	658	358		2 102	40				17	28	40
Rocky Boy's	196	193	31	121	34	2		5	9	129	13	34
Tongue River	431	362	121	41	71	2		104	6	1		3
Nebraska	1,435	985	635			206	12	115	27	70	316	134
Santee (under Yankton, S. Dak.)	356	209	114			43		52		4	120	27
Ponca	148	65	38			17	10			11	66	17
Winnebago												
Winnebago	385	298	210			46		28	14	35	57	30
Omaha	546	413	263			160	2	35	13	20	73	60
Nevada	1,285	1,006	513	164	151	153		1	24	53	2	277
Carson	558	428	265	45	114			1	3	3	1	129
Moapa River (under Paiute, Utah)						16				6		7
Walker River												
Fallon	109	93	30	28		35				7		16
Walker River	104	87	9	41		37				7		17
Mason-Smith Valleys	92	61	18	1		42				16	1	30
Scattered Indians	97	76	70			6				5		21

Western Shoshone.....	124	85	4	17				18	9		18
Prairie Lake.....	104	19	33	984	296	483	153	36	340	34	36
New Mexico	4,776	121	1,320	984	296	483	153	142			4,357
Eastern Navajo.....	2,838	32	500	104	17	67	11	76	5	8	1,959
Huarilla.....	195	8		17	10	11			7	7	38
Mescalero.....	181	3	110	10	11	11					2,007
Northern Navajo.....	3,077	9	710	161	152	38	55	48	97	1	20
Northern Pueblos.....	576	1	322	177	92	157		66	102	17	200
Southern Pueblos.....	1,761	67	794	374	204	157		45	1	1	54
Zuni.....	1,484	4	118	90	1	366		9	63	495	17
North Carolina: Cherokee	539	4	553	9	40	366	79	4	133	445	466
North Dakota	3,318	204	650	273	150	1,044	1	4	260	4,989	716
Fort Berthold.....	433	119	365	88	9	1			70	43	148
Fort Totten.....	259	35	77	5	128	86			73		253
Standing Rock.....	463	176	106	35	40	195		4			63
Turtle Mountain.....	2,163	364	180	145		105				37	62
Oklahoma	37,421	1,477	2,406	1,173	150	1,044	1	4	105	378	308
Cheyenne and Arapaho.....	678	487	2,406	1,173	9	1			260	4,989	716
Kiowa.....	1,897	200	605	92		33			70	43	148
Osage.....	1,290	874	605	92		33					253
Pawnee.....	1,227	1,013				86					63
Kaw.....	175	76	22	12		1			2	51	13
Pawnee.....	250	76	105	13						38	18
Ponca.....	235	193	107	14	4				16	11	31
Otoe.....	257	194	99	18					9	33	30
Tonkawa.....	24	18							1	3	3
Quapaw.....	864	353	62	19		2			17	528	3
Shawnee.....	1,158	717	27	37	18	52		4	72	149	154
Five Civilized Tribes.....	30,633	26,500	1,261	959		869				4,133	
Cherokee Nation.....	14,391	10,182	506	448		255				3,003	
Chickasaw Nation.....	3,066	2,733	140	87		29				77	
Chickasaw Nation.....	5,685	4,649	212	212		375					
Creek Nation.....	6,535	4,989	141	194		141				1,053	
Seminole Nation.....	953	858	8	18		69					
Oregon	1,140	944	138	112	12	108	22	51	59	127	
Klamath.....	391	367	4	36		48		25			24
Salem.....											
Slidaz.....	134	103		25	1			1		24	7
Grand Ronde.....	109	81	1	10	1	1		4		23	5
Public Domain.....	14	3		3						11	
Umatilla.....	236	199		21	10	59			19	1	36
Warm Springs.....	256	201	133	17					12	55	
South Dakota	7,748	2,150	1,096	889	96	1,332	23	465	7	550	837
Cheyenne River.....	927	846	210	107		113			27	18	63
Crow Creek.....											
Crow Creek.....	238	219	3	24		81			13	15	4
Lower Brule.....	191	162	21	31	55					13	16
Flandreau.....	105	93		37	3	2				11	2
Pine Ridge.....	2,300	1,999	441	136	31	424		3	82	10	291
Rosebud.....	1,913	1,481	281	170	7	443		6	260	219	213
Sisseton.....	842	716	2	250		137		8	47	55	11
Standing Rock.....	590	463	128	41		58		6		72	72
Yankton.....	641	382		93		74			36	194	65

For footnotes see p. 148.

Table 3.—Indian school population and school enrollment during fiscal year ended June 30, 1933—Continued

State and jurisdiction	Indian children 6 to 18 years, inclusive	Enrollment, 6 to 18 years of age							Under 6 and over 18 years enrolled in all schools	Definite information not available	Not enrolled in any school	
		Total number	In local public	In Federal day	In Federal reservation boarding	In Federal non-reservation boarding	In mission, private and State day boarding	In sanatoria				
1	2	3	4	5	6	7	8	9	10	11	12	13
Utah	455	352	83	64	157	44				30	43	60
Uintah and Ouray	332	263	64	18	154	23		2	2	29	41	28
Paute:												
Goshute	42	37		33		4					1	4
Shivwits	25	21	5			15				1	1	3
Skull Valley	13	12		11		1						1
Scattered Bands	29	15	13	1		1						14
Allen Canyon (under Consolidated Ute)	14	4	1		3							10
Washington	2,946	2,490	1,951		6	174		203	156	35	196	260
Colville:												
Colville	584	450	299			26		123	2		83	51
Spokane	263	231	213					12	6	6		32
Neah Bay	120	84	73			11					35	1
Taholah	284	246	191			21		2	32		5	33
Tulalip	1,047	912	750			66		15	81		1	134
Yakima	648	567	425		6	50		51	35	29	9	9
Wisconsin	2,300	1,633	388	132	186	129	266	515	17	60	386	281
Hayward	446	316	163		79			74			55	74
Keshena	570	546	32	22	104	4	87	288	9	51	1	23
Lac du Flambeau:												
Lac du Flambeau	223	179	40	110		26		2	1	5	9	35
Red Cliff	157	75	3			7	65				61	21
Crandon	183	91	70		3	10		3	5	1	14	48
Bad River	322	186	42			28	114		2		103	33
Tomah	429	240	38			54		148			3	143
Wyoming	649	588	160		125	31		272		14	1	60
Shoshone:												
Shoshone	327	301	136		113	21		31		9		26
Arapahoe	322	287	24		12	10		241		5	1	34

1 1932 figures.

2 All children above fourth grade attend public school.

3 148 of this number are housed in dormitory.

4 *Five Civilized Tribes*—The total scholastic population is taken from the State enumeration and is not inclusive of all Indian children of the Five Civilized Tribes. The enrollment figures include children who are under 6 and over 18 years of age. The Indian pupils reported as in public schools include only those for whom tuition was paid, and do not include children enrolled in public schools in incorporated towns; these children are shown under column 12. The supervisor of Indian education in Oklahoma estimates that there were 4,406 Five Civilized Tribes children enrolled in incorporated towns in 1932-33.

5 109 additional children housed in dormitories but attend public school and counted in column 4.

Table 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1933

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Total	29,062	25,147	-----	
Arizona:				
Colorado River Agency:				
Colorado River.....	95	93	B-6	Reservation, boarding.
Fort Apache Agency:				
Fort Apache.....	439	427	B-8	Do.
Canyon.....	35	33	B-2	Day.
Cibicue.....	33	30	B-2	Do.
Havasupai Agency:				
Havasupai.....	40	38	B-7	Do.
Hopi Agency:				
Hopi.....	172	167	B-7	Reservation, boarding.
Chimopovy.....	68	66	B-6	Day.
Hotevilla-Bacabi.....	93	88	B-7	Do.
Oralbi.....	70	65	B-7	Do.
Polacca.....	125	115	B-7	Do.
Second Mesa.....	65	57	B-6	Do.
Leupp Agency:				
Leupp.....	407	386	B-8	Reservation, boarding.
Phoenix School:				
Phoenix.....	860	752	6-12	Nonreservation, boarding.
Salt River.....	143	121	B-5	Day.
Pima Agency:				
Pima.....	241	175	1-9	Do.
Blackwater.....	41	33	B-2	Do.
Casa Blanca.....	100	81	B-6	Do.
Chui Chiuschu.....	20	13	B-3	Do.
Gila Crossing.....	72	56	B-5	Do.
Maricopa.....	26	25	B-4	Do.
Santan.....	122	90	B-5	Do.
San Carlos Agency:				
San Carlos.....	200	183	B-6	Reservation, boarding.
San Carlos.....	69	58	B-6	Day.
Sells Agency:				
Poso Redondo.....	37	19	B-3	Do.
Santa Rosa.....	129	93	B-4	Do.
San Xavier.....	91	77	B-5	Do.
Sells-Vamori.....	80	63	B-5	Do.
Ventena.....	57	40	B-6	Do.
Southern Navajo Agency:				
Chin Lee.....	152	135	B-5	Reservation, boarding.
Southern Navajo.....	435	404	B-7	Do.
Tohatchi.....	240	229	B-5	Do.
Cornfields.....	33	31	B-2	Day.
Crystal.....	32	25	B-2	Do.
Kinlichee.....	34	33	B-1	Do.
Klagetoh.....	35	33	B	Do.
Theodore Roosevelt School.....	416	389	B-9	Nonreservation, boarding.
Truxton Canon School.....	208	206	B-8	Reservation, boarding.
Western Navajo Agency:				
Western Navajo.....	339	329	B-7	Do.
Moencopi.....	55	54	B-4	Day.
California:				
Fort Yuma Agency:				
Fort Yuma.....	154	120	B-7	Do.
Hoopa Valley Agency:				
Hoopa Valley.....	95	82	B-6	Do.
Mission Agency:				
Campo.....	17	14	B-5	Do.
Mesa Grande.....	16	15	B-4	Do.
Pala.....	17	14	B-3	Do.
Rincon.....	30	27	B-6	Do.
Volcan.....	27	22	B-4	Do.
Sacramento Agency:				
Fort Bidwell.....	21	16	B-8	Do.
Sherman Institute.....	1,015	898	6-12	Nonreservation, boarding.
Colorado:				
Consolidated Ute Agency:				
Ignacio.....	225	216	B-8	Reservation, boarding.
Ute Mountain.....	167	160	B-8	Do.
Florida:				
Seminole Agency:				
Seminole.....	20	7	B-6	Day.
Idaho:				
Fort Hall Agency:				
Fort Hall.....	236	225	B-8	Reservation, boarding.
Iowa:				
Sac and Fox Agency:				
Mesquakie.....	57	42	B-4	Day.

Table 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1933—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Kansas:				
Haskell Agency:				
Haskell Institute.....	972	823	9-12	Nonreservation, boarding.
Kickapoo.....	21	18	B-8	Day.
Michigan:				
Mount Pleasant School.....	448	351	1-9	Nonreservation, boarding.
Minnesota:				
Consolidated Chippewa Agency:				
Pine Point.....	83	60	B-6	Day.
Pipestone School.....	357	328	B-9	Nonreservation, boarding.
Red Lake Agency:				
Cross Lake.....	107	103	B-7	Reservation, boarding.
Red Lake.....	144	120	B-8	Do.
Mississippi:				
Choctaw Agency:				
Bogue Chitto.....	25	22	B-3	Day.
Bogue Homo.....	25	18	B-6	Do.
Conehatta.....	68	47	B-5	Do.
Pearl River.....	81	64	B-6	Do.
Red Water.....	48	42	B-6	Do.
Standing Pine.....	34	29	B-5	Do.
Tucker.....	62	52	B-6	Do.
Montana:				
Blackfeet Agency:				
Blackfeet.....	198	151	1-10	Reservation, boarding.
Heart Butte.....	39	27	B-3	Day.
Fort Belknap Agency:				
Fort Belknap.....	168	128	1-9	Reservation, boarding.
Fort Peck Agency:				
Fort Peck.....	148	114	B-12	Do.
Rocky Boy's Agency:				
Haystack Butte.....	25	22	B-6	Day.
Parker Canyon.....	22	19	B-5	Do.
Rocky Boy's.....	43	31	B-8	Do.
Sangrey.....	31	23	B-6	Do.
Tongue River Agency:				
Tongue River.....	73	71	B-6	Reservation, boarding.
Birney.....	41	38	B-5	Day.
Nebraska:				
Genoa School.....	560	481	2-12	Nonreservation, boarding.
Nevada:				
Carson Agency:				
Carson.....	637	556	B-10	Do.
Fort McDermitt.....	48	40	1-6	Day.
Pyramid Lake Agency:				
Nevada.....	59	52	B-7	Do.
Walker River Agency:				
Fallon.....	34	25	B-3	Do.
Walker River.....	54	36	B-7	Do.
New Mexico:				
Albuquerque School.....	926	881	7-12	Nonreservation, boarding.
Charles H. Burke.....	660	560	2-12	Do.
Eastern Navajo Agency:				
Eastern Navajo (Pueblo Bonito).....	413	365	B-6	Reservation, boarding.
Pinedale.....	30	26	B-3	Day.
Mescalero Agency:				
Mescalero.....	112	110	B-6	Reservation, boarding.
Northern Navajo Agency:				
San Juan.....	413	403	B-7	Do.
Toadlena.....	247	228	B-7	Do.
Nava.....	58	45	B-4	Day.
Redrock.....	50	31	B-3	Do.
Saynostee.....	38	25	B-2	Do.
Tecnospos.....	22	20	B	Do.
Santa Fe Agency:				
Santa Fe.....	647	563	1-11	Nonreservation, boarding.
Picuris.....	21	20	B-3	Day.
San Ildefonso.....	14	13	B-4	Do.
San Juan.....	80	75	B-6	Do.
Santa Clara.....	50	45	B-5	Do.
Taos.....	153	146	B-7	Do.
Tesuque.....	12	10	B-4	Do.
Southern Pueblos Agency:				
Acoma.....	87	75	B-6	Do.
Chicale.....	25	22	B-6	Do.
Cochiti.....	37	34	B-5	Do.
Encinal.....	22	21	B-6	Do.
Isleta.....	91	83	B-6	Do.
Jemez Mission.....	37	34	2-3	Do.
Jemez.....	63	52	3-4	Do.
Laguna.....	47	46	B-6	Do.

Table 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1933—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
New Mexico—Continued.				
Southern Pueblos Agency—Continued.				
McCartys.....	70	65	B-6	Day.
Mesita.....	20	17	B-6	Do.
Paguata.....	77	66	B-6	Do.
Paraje.....	33	30	B-5	Do.
Sandia.....	19	19	B-4	Do.
San Felipe.....	60	53	B-6	Do.
Santa Ana.....	25	23	B-6	Do.
Santo Domingo.....	111	95	B-5	Do.
Seama.....	32	27	B-6	Do.
Sia.....	13	13	B-4	Do.
Zuni Agency:				
Zuni.....	131	122	B-8	Do.
North Carolina:				
Cherokee Agency:				
Cherokee.....	375	336	B-9	Reservation, boarding.
Cherokee.....	103	65	B-9	Day.
Big Cove.....	19	16	B-4	Do.
Birdtown.....	65	46	B-6	Do.
North Dakota:				
Bismarck School.....	134	122	1-9	Nonreservation, boarding.
Fort Berthold Agency:				
Independence.....	25	19	B-3	Day.
Shell Creek.....	44	25	B-6	Do.
Fort Totten School.....	296	268	1-9	Reservation, boarding.
Standing Rock Agency:				
Standing Rock.....	253	224	1-8	Do.
Turtle Mountain Agency:				
Turtle Mountain.....	581	391	1-8	Day.
Indian Day No. 5.....	81	40	B-6	Do.
Wahpeton School.....	369	336	B-9	Nonreservation, boarding.
Oklahoma:				
Cheyenne and Arapaho Agency:				
Cheyenne and Arapaho.....	262	216	1-9	Reservation, boarding.
Chilocco School.....	1,062	857	6-12	Nonreservation, boarding.
Kiowa Agency:				
Anadarko.....	165	130	B-6	Reservation, boarding.
Fort Sill.....	225	203	1-9	Do.
Riverside.....	278	214	1-7	Do.
Pawnee Agency:				
Pawnee.....	350	302	1-10	Do.
Quapaw Agency:				
Seneca.....	267	254	1-9	Do.
Five Civilized Tribes Agency:				
Sequoyah Orphan Training School.....	365	341	1-11	Nonreservation, boarding.
Creek Nation:				
Euchee.....	137	111	B-9	Do.
Enfaula.....	161	150	B-9	Do.
Chickasaw Nation:				
Carter Seminary.....	202	170	1-9	Do.
Choctaw Nation:				
Jones Male Academy.....	204	179	1-9	Do.
Wheelock Academy.....	145	130	B-9	Do.
Oregon:				
Salem School.....	848	752	7-12	Do.
Warm Springs Agency:				
Warm Springs.....	136	127	B-8	Reservation, boarding.
Burns.....	29	28	B-6	Day.
South Dakota:				
Cheyenne River Agency:				
Cheyenne River.....	236	204	B-8	Reservation, boarding.
Cherry Creek.....	33	23	B-5	Day.
Green Grass.....	22	19	B-6	Do.
Thunder Butte.....	21	17	B-6	Do.
Flandreau School.....	482	428	9-12	Nonreservation, boarding.
Pierre School.....	239	307	1-9	Do.
Pine Ridge Agency:				
Pine Ridge (Oglala).....	517	439	B-9	Reservation, boarding.
No. 4.....	23	18	B-6	Day.
No. 5.....	43	31	B-6	Do.
No. 6.....	27	18	B-6	Do.
No. 6.....	33	21	B-6	Do.
No. 7.....	35	22	B-6	Do.
No. 9.....	30	14	B-6	Do.
No. 10.....	22	13	B-6	Do.
No. 12.....	17	15	B-3	Do.
No. 15.....	30	21	B-6	Do.
No. 16.....	16	11	B-5	Do.
No. 17.....	15	9	B-6	Do.
No. 19.....	21	13	B-4	Do.
No. 20.....				

Table 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1933—Continued

State agency, and school	Enroll- ment	Average attend- ance	Grades taught	Class of school
South Dakota—Continued.				
Pine Ridge Agency—Continued.				
No. 21.....	25	15	B-6	Day.
No. 22.....	19	15	B-6	Do.
No. 23.....	25	23	B-6	Do.
No. 24.....	41	25	B-6	Do.
No. 25.....	18	16	B-5	Do.
No. 26.....	16	9	B-6	Do.
No. 27.....	29	18	B-6	Do.
No. 28.....	20	13	B-6	Do.
No. 29.....	22	14	B-6	Do.
Red Shirt Table.....	22	13	B-6	Do.
Rapid City School.....	317	279	4-9	Nonreservation, boarding.
Rosebud Agency:				
Rosebud.....	286	248	B-9	Reservation, boarding.
Blackpipe.....	30	23	B-6	Day.
Cut Meat.....	31	21	B-5	Do.
He Dog's Camp.....	30	22	B-6	Do.
Little Crow.....	32	23	B-6	Do.
Milk's Camp.....	32	17	B-6	Do.
Oak Creek.....	26	23	B-6	Do.
Spring Creek.....	39	29	B-4	Do.
Upper Cut Meat.....	27	17	B-6	Do.
Utah:				
Palute Agency:				
Goshute.....	46	39	B-7	Do.
Kaibab.....	15	12	B-6	Do.
Uintah and Ouray Agency:				
Uintah.....	172	137	B-7	Reservation, boarding.
Ouray.....	19	17	B-4	Day.
Wisconsin:				
Hayward School.....	193	164	1-8	Reservation, boarding.
Keshena Agency:				
Keshena.....	153	139	B-9	Do.
Neopit.....	37	25	1-8	Day.
Lac du Flambeau Agency:				
Lac du Flambeau.....	129	106	1-7	Do.
Tomah School.....	331	312	1-9	Nonreservation, boarding.
Wyoming:				
Shoshone Agency:				
Shoshone.....	130	104	B-9	Reservation, boarding.

SCHOOL SUMMARY

Class	Number of schools	Enroll- ment	Average at- tendance
Total	197	29,062	25,147
Nonreservation, boarding.....	25	12,594	11,066
Reservation.....	40	9,632	8,662
Day.....	132	6,836	5,419

OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS

(ARNO B. CAMMERER, Director)

The resignation on August 9, 1933, of Horace M. Albright, Director of the National Park Service and for over 20 years connected closely with all national-park activities and progress, was a great loss to the Federal Government in national-park work. Conservationists throughout the country as well as high officials of the Federal Government, headed by the President and yourself, expressed deep regret at his decision to resign. Mr. Albright's career in Government service was a brilliant one. Since his appointment as director of the National Park Service in January 1929, the Service expanded in scope and in personnel, particularly in Washington. Outstanding among the new developments during his administration were the establishment of the branch of research and education in the Washington headquarters, the expansion of landscape architectural work, and the establishment of eastern headquarters of both the branch of engineering and the branch of plans and designs.

He was particularly interested in the consolidation of all Federal-park activities and worked out the reorganization plan under which the military parks and monuments and the parks of the National Capital were consolidated with the national park and monument system under the jurisdiction of the National Park Service.

Extension of the landscape architectural activities and development of the 6-year master plans for all national parks received special attention from him. Had not this advance planning been done, the National Park Service would have been unable to take part so quickly and competently in the emergency conservation and public-works program.

The historical program also was developed under Mr. Albright's personal guidance, beginning with the Colonial and George Washington Birthplace National Monuments in Virginia, established in 1930. With the addition of the military areas, which in reality are historical parks, and of the new Morristown National Historical Park in New Jersey, established last July, a definite basis for historical development is available. In addition to the Morristown National Historical Park, 3 national parks and 10 national monuments were established during Mr. Albright's term as director.

Immediately prior to assuming the directorship, he was the first civilian superintendent of Yellowstone National Park, assuming charge in 1919. Under the approximately 10 years during which he retained that position that park made remarkable strides forward in all lines.

Prior to that, Mr. Albright was the first assistant director of the National Park Service and, during the illness of Director Mather at the period of establishment, he actually organized the National Park Service and put it on a working basis, serving as acting director from May 1917 to March 1918. As assistant director (field) during his Yellowstone incumbency he devoted much time to general park problems, particularly to the concession system, and worked out many of the franchises still in operation.

Shortly before he resigned as Director, Mr. Albright had conferred upon him by the American Scenic and Historic Preservation Society the Pugsley gold medal for outstanding conservation work in the field of national parks.

REORGANIZATION UNDER PRESIDENT'S EXECUTIVE ORDER

On June 10 President Roosevelt issued an Executive order which among other consolidations, provided that "All functions of administration of public buildings, reservations, national parks, national monuments, and national cemeteries are consolidated in an Office of National Parks, Buildings, and Reservations in the Department of the Interior, at the head of which shall be a Director of National Parks, Buildings, and Reservations," and that this transfer and consolidation of functions "shall include, among others, those of the National Park Service of the Department of the Interior and the National Cemeteries and Parks of the War Department which are located within the continental limits of the United States." This merger of functions took effect partially on August 10 when officials of the National Park Service became officials of the new Office of National Parks, Buildings, and Reservations, and took over supervision of certain public buildings, the National Capital parks, and the military parks, monuments, certain national cemeteries, and allied reservations, and certain national monuments formerly under the supervision of the Department of Agriculture.

At that time the functions of the Arlington Memorial Bridge Commission, the Office of Public Buildings and Public Parks of the National Capital, the National Memorial Commission, the Public Buildings Commission, and the Rock Creek and Potomac Parkway Commission, in accordance with the Executive commission were transferred to the new organization and the agencies listed abolished.

In that connection the director of the Office of National Parks, Buildings, and Reservations became the vice chairman and executive

officer of the National Capital Park and Planning Commission. He is also a member of the Zoning Commission of the District of Columbia and of various other organizations. Expenditure of funds for the National Capital Park and Planning Commission was taken over by the disbursing officer of the Department of the Interior. The expenditures of the Commission of Fine Arts, the George Rogers Clark Sesquicentennial Commission, and the Rushmore National Commission were also placed under the supervision of the Secretary of the Interior through this Office.

Under the reorganization the former Office of Public Buildings has been separated into two units—the Branch of Public Buildings and a System of National Capital Parks. Final consolidation and reappointment of personnel of the various bureaus under the Office of National Parks, Buildings, and Reservations was postponed by later Executive order until September 30.

Officers of the Office of National Parks, Buildings, and Reservations are convinced that the new organization, comprising as it does a consolidation of all Federal-park activities under one responsible head, will be a smoothly functioning machine that will measure up to the best traditions of the various organizations involved and furnish to the public service of the highest type.

SUMMARY OF ACTIVITIES

As usual, developments during the year were varied and interesting. The consolidation of certain park and buildings operations already has been covered.

Outstanding among the achievements was the operation of 175 citizens civilian conservation summer camps in national parks, national monuments, national military parks, State parks, and other related areas. Approximately 35,000 young men carried on this valuable emergency conservation work. Three hundred winter camps will be operated in these areas.

Congress continued its sympathetic consideration of the needs of the national parks and national monuments. During the busy days of the last session of the Seventy-second Congress and the first session of the Seventy-third Congress, when much legislation of an emergency character required attention, the members of these Congresses took time to pass nine important pieces of legislation involving National Park Service activities, including appropriation measures.

Other measures still pending on House and Senate calendars for possible consideration next session cover the establishment of the Boulder Canyon national reservation in the States of Arizona and Nevada, the establishment of the Everglades national park in Florida, the creation of a national-park trust-fund board to man-

age and invest gifts of funds and property, and the creation of the Saratoga national monument in New York.

Exclusive jurisdiction over the Hot Springs National Park in Arkansas was ceded to the Federal Government by act of the State legislature approved March 25, 1933. Heretofore the Federal Government had been ceded jurisdiction over three separate areas in the park. This newest cession gives exclusive jurisdiction over all lands now or hereafter to be included in the park.

Upon consolidation of the various Governmental functions outlined in the Executive order of June 10, 1933, the Office of National Parks, Buildings, and Reservations took over from the War Department the management of 11 national military parks, 2 national parks, 10 battlefield sites, 10 national monuments, 4 miscellaneous memorials, and 11 national cemeteries.

The Morristown National Historical Park in New Jersey, the first reservation of that designation in the National Park Service, was established July 4, 1933. Additions were made to the Acadia, Carlsbad Caverns, Hot Springs, and Yellowstone National Parks, and the Colonial, Colorado, and Petrified Forest National Monuments. Five new national monuments were established. These are Grand Canyon, White Sands, Death Valley, Black Canyon of the Gunnison, and Cedar Breaks. The Mowich or northwest entrance to Mount Rainier National Park was dedicated on September 2 and a plaque unveiled to Dr. William Fraser Tolmie, the first white man to visit the area. Premier S. F. Tolmie, of British Columbia, was guest of honor at the dedication.

Important among road achievements were the completion and dedication of the Wawona Tunnel and the practical completion of the Wawona Highway in Yosemite National Park, completion and dedication of the Going-to-the-Sun Highway in Glacier National Park, completion of the General Grant unit of the Generals' Highway, and improvement of approach roads to the Southwestern monuments. Noteworthy achievements were made in museum expansion and other phases of the educational work were conducted intensively with reduced personnel. The Division of Wild Life Studies was established as a full-time Government activity. Master development plans were completed for most of the national parks and national monuments under the supervision of the National Park Service before consolidation of the various Federal functions took place. Winter sports use of the national parks continued to gain in popularity.

EMERGENCY CONSERVATION WORK

Officials of the National Park Service have a deep appreciation that they were enabled to assist in carrying out President Roosevelt's emergency conservation program, one of the greatest humanitarian

movements ever conceived for the relief of distress. In addition to its primary purpose of relief, the conservation work accomplished will be of far-reaching importance to the whole country and will build up the health and morale of a large portion of the young manhood of the Nation, fitting them better to be leaders of the future.

Following the passage of the necessary legislation and its approval on March 31, the President appointed Robert Fechner as Director of Emergency Conservation Work and designated as an advisory council to him one representative each from the Department of Labor, the War Department, the Department of Agriculture, and the Department of the Interior. Former Director Albright represented the Interior Department on this board, with the associate director serving as alternate. The present Director now represents the Department.

In addition to the emergency forestation work upon the national parks and national monuments, the National Park Service was charged with the supervision of such work on military parks and monuments, State parks, and 1 or 2 related areas.

As soon as the emergency conservation program received presidential approval, 70 emergency conservation camps were established in national parks and monuments, including the military areas, and 105 on State park and allied lands, making a total of 175 camps thus supervised. The personnel of these camps included 35,000 enrolled men and approximately 2,300 men in supervisory and advisory capacities.

All work within the areas under the jurisdiction of the National Park Service was carefully planned by experienced landscape architects, park engineers, and foresters, and in the historical and military parks historical technicians were employed to insure the careful preservation and interpretation of the historic values. The establishment of emergency conservation camps within these areas, particularly in the national parks, permitted the accomplishment of work that had been needed greatly for years, but which was impossible and would doubtless have continued impossible of accomplishment under the ordinary appropriations available.

Especially has the fire hazard been reduced and the appearance of forest stands greatly improved by clean-up work along many miles of park highways; many acres of unsightly burns have been cleared; miles of fire trails and truck trails have been constructed for the protection of the park forests and excellent work accomplished in insect control and blister-rust control and in other lines of forest protection; improvements have been made in the construction and development of telephone lines, fire lookouts, and guard cabins; and landscaping and erosion control has been undertaken.

An important step in highway beautification is in progress along the highway from Ellsworth to Bar Harbor, Maine, an approach to the

Acadia National Park, by members of the Civilian Conservation Corps under national-park supervision. This was undertaken at the request of the State of Maine, in cooperation with the American Legion of Ellsworth, and includes roadside planting and elimination of unsightly telephone and electric-light poles under scenic easements obtained from property owners. In this connection the State is securing scenic easements to prevent the erection of hot-dog stands and other unsightly structures along the beautiful highway.

At the present time, plans are under way for the inauguration of the second emergency conservation enrollment. It is now anticipated that 56 of the present camps will be discontinued at the end of the first enrollment period and that such men as wish to enroll for the second period will be moved to other locations. Sixty-one camps in the national parks and monuments, including the military parks and monuments, are planned for the winter, and 239 in the State parks and allied areas.

MATHER MEMORIAL PLAQUES

The Stephen T. Mather Appreciation, an organization formed to honor the memory of the first Director of the National Park Service, practically completed its work this year. In all, 18 bronze plaques have been presented to the proper authorities for placement in parks and monuments. Fifteen of these have been fittingly installed and dedicated, many of the ceremonies taking place last year on July 4, Mr. Mather's birthday.

One plaque has been placed in Casa Grande National Monument but not yet dedicated. Another will be located over the fireplace of the administration building in Hawaii National Park. The eighteenth tablet has been delivered to the Superintendent of Acadia National Park, but its location not determined.

On May 27, Mrs. Franklin D. Roosevelt unveiled the plaque placed last year in the Bear Mountain section of the Palisades Interstate Park. The Secretary of the Interior and Horace M. Albright, then Director of the National Park Service, flew from Washington to participate in the ceremony. Secretary Ickes made an address in which he paid a splendid tribute to Mr. Mather's great work for humanity.

The plaque placed in Glacier National Park was dedicated on July 15, the occasion of the formal opening of the Going-to-the-Sun Highway. This great scenic road project was of vital interest to Mr. Mather. Traveling on horseback, he personally located much of the route and selected many of the concentration points affording magnificent panoramas of park scenery. O. S. Warden, Chairman of the Montana State Highway Commission, dedicated the memorial tablet which is along the parkway of Logan Pass.

All of Mr. Mather's friends are deeply grateful to Mr. and Mrs. Franklin Adams of Washington, who have alternately and devotedly acted as secretary of the Appreciation, for their splendid service in perpetuating the memory of our beloved leader and friend.

ENLARGEMENT OF NATIONAL PARK AND MONUMENT SYSTEM

Expansion of the National Park and Monument System under the supervision of the Department of the Interior occurred in three ways during the past year—through the establishment of six additional areas for administration by this Department in accordance with the act establishing the National Park Service, through additions to existing areas, and through the consolidation of functions of several bureaus, already referred to, under which the expanded organization took over the management of 48 areas formerly administered by the War Department.

THE NEW MORRISTOWN NATIONAL HISTORICAL PARK

The first national historical park to be established, as such, was created on July 4, 1933, when the deeds to lands in the Morristown (N.J.) area were accepted on behalf of the United States and formally dedicated to public-park use.

Morristown fittingly was chosen as the first national historical park, since throughout the dark days of the Revolutionary War it served as the base hospital of the Colonial Army and during the winters of 1776-77 and 1779-80 was the main camp site of the American armies. During the period of the war, General Washington spent practically a year in Morristown, counting actual days, and the area is rich in Washingtonia.

It is expected that historical parks in the future will form a definite unit of the National Park and Monument System and the historian forces of this Office now are making a thorough study of outstanding historical events of the Nation, so that a definite program for the establishment of additional parks of this nature may be recommended at a later date.

NEW NATIONAL MONUMENTS

The five national monuments established since the submission of the last annual report are as follows:

Black Canyon of the Gunnison National Monument, Colo., consisting of 11,157.76 acres; established March 2, 1933: This monument takes in 10 miles of the most scenic section of the Black Canyon of the Gunnison River. The section of the canyon included is deep and narrow and its walls expose the interesting geological formation of the region.

Cedar Breaks National Monument, Utah, containing approximately 5,790.05 acres; established August 22, 1933: This area will come under the jurisdiction of the superintendent of Bryce Canyon and Zion National Parks, and with them and the Grand Canyon will tell the story of erosion in the area. Cedar Breaks, formerly a part of the Dixie National Forest, is a series of amphitheaters, eroded to a depth of 2,000 feet in the pink cliff formation at the summit of the plateau. It is an example of the first effects of erosion, Bryce Canyon of the second step, and Zion the third. The Grand Canyon, farther to the south, depicts yet another step in the erosional processes of the Southwest.

Death Valley National Monument, Calif., containing 1,609,800 acres; established February 11, 1933: This monument is the third largest area under the administration of the Office of National Parks, Buildings, and Reservations. In Death Valley, the outstanding desert in the United States and made famous by the early pioneers and prospectors and later by "Death Valley" Scotty, is the lowest point in the United States; and from the mountains which form the eastern boundary of the monument may be seen Mount Whitney, the highest point in continental United States, outside of Alaska.

Grand Canyon National Monument, Ariz., consisting of 273,145 acres and immediately west of and adjacent to the Grand Canyon National Park; established December 22, 1932: From Toroweap Point in this monument may be viewed the inner gorge of the Colorado River, which in the Grand Canyon National Park may be viewed only after a strenuous mule-back ride or hike to the inner gorge. Eventually it is hoped to add the Grand Canyon National Monument to the Grand Canyon National Park.

White Sands National Monument, N.Mex., containing an area of 142,987 acres; established January 18, 1933: With its white sand dunes of almost pure gypsum, it is of great interest from a scientific and geologic standpoint.

ADDITIONS TO EXISTING PARKS AND MONUMENTS

Again during the past year consideration was given to the problem of adjusting boundaries of existing parks and monuments, to simplify administration by providing natural boundaries along topographic lines, and in some cases to include areas of scenic or scientific importance.

These adjustments included:

Acadia National Park, Maine.—The total area of this park was increased to 12,312.11 acres by the donation of 452.79 acres to the Government. Credit is due John D. Rockefeller, Jr., and Superintendent Dorr of the park for this donation.

Carlsbad Caverns National Park, N.Mex.—An area of 9,239.94 acres was added to this park by Presidential proclamation dated February 21, 1933, for administrative and development purposes. The addition of this land makes possible the improvement of the road up Walnut Canyon from the main highway to the caverns' entrance. The total area for the park now is 9,959.16 acres.

Hot Springs National Park, Ark.—Through a re-survey of its old boundaries, 18.79 acres were added to this park, bringing its total area to 945.79 acres.

Yellowstone National Park, Wyo.—By Presidential proclamation dated October 20, 1932, 7,600 acres were added on the north boundary. The new area is an important winter feeding ground for the Yellowstone elk.

Colonial National Monument, Va.—By transfer from the Navy Department, 331.52 acres were added, bringing its total area to 2,707.30 acres.

Colorado National Monument, Colo.—For administrative and development purposes, 3,789.74 acres were added by Presidential proclamation of March 3, 1933, bringing its total area to 17,539.21 acres.

Petrified Forest National Monument, Ariz.—The addition of 53,309 acres in the famous Painted Desert, including the Black Petrified Forest and a parkway between the Petrified Forest and the Painted Desert, more than doubled its area, which now has a total of 90,302.37 acres. The new parkway serves a double purpose in that it gives direct access to the Petrified Forest from Highway U S 66, the main transcontinental highway through the State of Arizona. Enlargement of the forest was the result of exchange agreements reached with the Santa Fe Railroad and private individuals owning lands in the newly added areas.

AREAS TRANSFERRED FROM THE WAR DEPARTMENT

By Executive order of President Roosevelt consolidating certain park and buildings activities, the following reservations under the War Department were transferred, for administration with the national parks and national monuments, to the Department of the Interior:

National military parks: Chickamauga and Chattanooga, Ga. and Tenn.; Fort Donelson, Tenn.; Fredericksburg and Spotsylvania County Battle Fields Memorial, Va.; Gettysburg, Pa.; Guilford Courthouse, N.C.; Kings Mountain, S.C.; Moores Creek, N.C.; Petersburg, Va.; Shiloh, Tenn.; Stones River, Tenn.; and Vicksburg, Miss.

National parks: Abraham Lincoln, Ky.; and Fort McHenry, Md.

Battlefield sites: Antietam, Md.; Appomattox, Va.; Brices Cross Roads, Miss.; Chalmette Monument and Grounds, La.; Cowpens, S.C.; Fort Necessity, Fayette County, Pa.; Kenesaw Mountain, Ga.; Monocacy, Md.; Tupelo, Miss.; and White Plains, N.Y.

National monuments: Big Hole Battlefield, Beaverhead County, Mont.; Cabrillo, Fort Rosecrans, Calif.; Castle Pinckney, Charleston, S.C.; Father Millet Cross, Fort Niagara, N.Y.; Fort Marion, St. Augustine, Fla.; Fort Matanzas, Fla.; Fort Pulaski, Ga.; Meriwether Lewis, Hardin County, Tenn.; Mound City Group, Chillicothe, Ohio; and Statue of Liberty, Fort Wood, N.Y.

Memorials: Camp Blount Tablets, Lincoln County, Tenn.; Kill Devil Hill Monument, Kitty Hawk, N.C.; New Echota Marker, Ga.; and Lee Mansion, Arlington National Cemetery, Va.

Cemeteries: Battleground, D.C.; Antietam (Sharpsburg), Md.; Vicksburg, Miss.; Gettysburg, Pa.; Chattanooga, Tenn.; Fort Donelson (Dover) Tenn.; Shiloh (Pittsburgh Landing) Tenn.; Stones River (Murfreesboro) Tenn.; Fredericksburg, Va.; Poplar Grove, (Petersburg) Va.; and Yorktown, Va. The cemeteries transferred to the jurisdiction of the Department of the Interior included only those within or adjoining the military parks transferred.

As soon as possible after consolidation of functions and personnel is completed under the reorganization, consideration will be given to amalgamating the six classes of reservations thus transferred into the system of parks, national historical parks, and national monuments that has been administered by the National Park Service, with the idea of simplifying the combined areas into a system containing not more than 3 or 4 classes of reservations. Under the present line-up historical parks, military parks, battlefield sites, and some of the national monuments in both systems overlap in their functions and characteristics. It is probable, however, that such changes as are recommended will require Congressional sanction before becoming effective.

PENDING BOUNDARY PROBLEMS

Yellowstone.—No action has been taken by Congress on the report of the Yellowstone Park Boundary Commission of 1929. The report was filed in 1930, the recommendations being in line with those of the 1925 commission. The Commission urged immediate addition of the Bridger Lake and Two Ocean Pass region to Yellowstone Park and agreed that the entire Thorofare-Upper Yellowstone watershed is of national-park caliber. The Forest Service and Park Service have been in agreement on this project since 1918.

Rocky Mountain National Park.—Two important enlargement proposals have been under consideration. One contemplates the addition of the mountain and glacier country south of the park, a region

comprehended in the original park plan. The other attempts to solve the problem of bringing the new Trail Ridge Road to a suitable terminus at the park's headquarters office at the outskirts of the village of Estes Park. The plan does not require a large acreage. A parkway would more aptly describe the enlargement suggestion. This would vary in width from a hundred feet to perhaps a quarter of a mile. Within this strip of land, the highway would be completed from Moraine Park to Estes Park, and possibly another parkway would bring the Fall River Road to the western edge of the village.

The parkway plans were deferred through local confusion of a school bond question in its application to the acquisition of the parkway lands. Legislation is needed to effectuate all these plans. A proposal to eliminate from the park the lands north of the Mummy Range and including the watershed of the North Fork of the Big Thompson was advanced by certain stock growers, but it was not given favorable consideration by the Service. It required too big a concession of park values especially in timber to the needs of a few individuals.

The Grand Lake addition to the park has been authorized by Congress but was not consummated by Executive proclamation pending completion of plans for the improvement of the Grand Lake Village which, it is hoped, can be revamped into a typical frontier village of log buildings.

Other minor boundary adjustment proposals in the Never Summer Range remain as they were a year ago.

Yosemite National Park.—It is still hoped legislation can be secured to return to the park the lovely Minaret and Devils Post Pile region which was unwisely eliminated in 1904. No progress was made during the year in securing this enlargement of the park. It is one of the worthiest projects in the program of park completion. Opposition to the plan comes from interests who believe it has economic values that should be exploited.

Sequoia National Park.—No action was taken during the year on the proposals to adjust the boundaries of this park to include the Mineral King region lying at the head of the watershed of the East Fork of the Kaweah, every other part of which is in the park.

General Grant National Park.—Minor adjustments of the east and south lines of this park are required for administrative and protective purposes. It ought not to be difficult to solve this line change project, but other more pressing problems held it in abeyance this year.

Kings River Park.—Closely allied with the two park extension projects just described is the old, old plan to give park status to the Middle and South Forks of the Kings River lying north of the Sequoia Park, and for years promoted as an extension of the latter park. More recently the plan has contemplated a new park that would

embrace these two watersheds with their magnificent mountain scenery and also include General Grant Park as an isolated area.

This project was first formulated in the early nineties by the Sierra Club when under the leadership of the great naturalist John Muir. It has given constant attention by Directors Mather and Albright throughout their administrations covering a span of nearly 20 years, but local irrigation interests still feel that their potential water-storage rights cannot be protected in a national park, and they continue to oppose the plan. Meantime the Forest Service has employed landscape architects to study the area with a view to initiating a development of the region which it would seem must inevitably parallel our park system of protection and improvement. It is hardly conceivable that development of the region through application of park policies by another bureau would receive Congressional favor, especially in these days when overlapping of Government functions is being avoided in every possible way.

Grand Teton National Park.—The most important and urgent extension project affects one of our newest but unquestionably one of our greatest national parks. This is the proposal to add to Grand Teton Park a portion of the northern part of the Jackson Hole including more than 30,000 acres of private lands acquired by John D. Rockefeller, Jr., to be granted to the United States, over 40,000 acres of unappropriated public domain, and a tract of national-forest lands including the northern third of the Teton Range, Jackson Lake, and the road to Yellowstone.

Misunderstanding of this project continues and when a Senate inquiry into all its phases was proposed both Mr. Rockefeller and former Director Albright, as well as Secretary Wilbur, welcomed this effort to clarify the issues and impartially ascertain the facts. It is too early to predict what result the committee's study will bring in the way of consummation of one of the finest conservation projects ever conceived. This is a matter of greatest importance to the American people and it must not fail or be seriously curtailed in execution.

Crater Lake National Park.—The Diamond Lake extension to the north is important in the future development of Crater Lake National Park, but no agreement on this has yet been reached with the Forest Service, and the status of this area remains as it was a year ago.

INVESTIGATION OF PROPOSED PARKS AND MONUMENTS

A thorough study of Park Service files during the past year revealed the fact that all told there have been submitted for the consideration of this office proposals for the establishment of 88 national parks and 103 national monuments. It further indicated that 37 of the national-park proposals and 46 of the national monuments had been

investigated and reports made thereon. There still remain on the docket for investigation 51 proposed national-park areas and 57 proposed national monuments.

Three of the park projects investigated have been approved. These are the Guadalupe Mountains in Texas, approved as a desirable addition to the Carlsbad Caverns National Park; the Morristown National Historical Park in New Jersey, established last July; and the proposed Navajo National Park in northern Arizona and southern Utah, to take in part of the Paiute Strip, Navajo Mountain, Rainbow Bridge National Monument, Monument Valley, and the Navajo National Monument. This latter project, covering area in the Navajo Indian Reservation, has been submitted for consideration to the Navajo Tribal Council by the Bureau of Indian Affairs. Should this park be established it is proposed to enter into arrangements similar to those agreed upon when the Canyon de Chelly National Monument in Arizona was established; that is, in establishing the areas as a national park the Indians would not be disturbed by the Government's administration of the area from the standpoint of development, protection, and travel. Furthermore, the Indians would be given preference in the question of employment in connection with improvements in the area. The proposal was considered by the tribal council at its July meeting but was deferred for further consideration at a meeting to be held this fall.

The Guadalupe Mountains area, while already considered as an extension to the Carlsbad Caverns National Park, will be investigated further this winter as to the possibility of establishing a separate national park there.

Of the 46 proposals for the establishment of national monuments investigated, 27 were definitely disapproved. The following 9 were approved: Black Canyon of the Gunnison in Colorado, Cedar Breaks in Utah, Death Valley in California, White Sands in New Mexico, establishment of all four having already been accomplished; and De Soto on the west coast of Florida; Kolob Canyon, just north of Zion National Park in Utah; Palm Canyon in Riverside County, California; and the Painted Desert in Arizona, a portion of which already has been included in the Petrified Forest National Monument.

AUTHORIZED PARK PROJECTS

Although material progress has been made during the year toward the culmination of plans to establish the various eastern national parks approved by Congress, the actual status remains about the same as at the time of the last annual report of the National Park Service.

Great Smoky Mountains National Park.—Commissions of the States of North Carolina and Tennessee have made good progress toward

acquiring lands needed for the completion of the Great Smoky Mountains National Park, but no further deeds have been accepted by the United States. During the month of September representatives of both commissions conferred with representatives of the Office of National Parks, Buildings, and Reservations and formulated plans for acquiring the additional lands needed for park purposes. But three large tracts remain to be acquired in the North Carolina portion. Two of these the commission is arranging to purchase, and the third, covering approximately 33,000 acres, will be considered before a special term of the Superior Court of Buncombe County the latter part of October, as the former award was appealed by both the State and the land owners. There still remain two large tracts to be acquired in the Tennessee portion and 40 scattered small holdings. The Tennessee State Park and Forestry Commission decided to present to the courts, for condemnation, cases concerning all parcels of land in this area on which no agreement regarding the sale price could be reached as soon as funds were available.

Shenandoah National Park.—The Virginia State Conservation Commission hopes to obtain all lands for inclusion in the proposed Shenandoah National Park within the next 6 months. Authority recently was granted by the State legislature for the payment of land-owners within the proposed boundary who are willing to dispose of their holdings, and orders for condemnation proceedings in other cases have been presented to the court for signing. This will expedite the land-acquisition problem. Meanwhile four civilian conservation camps have been established in the proposed park area and work is being continued on the Skyline Drive.

Mammoth Cave National Park.—For the proposed Mammoth Cave National Park, the Kentucky National Park Commission and the Mammoth Cave National Park Association have acquired 38,000 acres including two major caves. The total minimum area of this project is 46,000 acres.

Everglades Project.—Again the question of establishing a national park in the Florida Everglades came up in Congress; again it passed in the Senate and failed in the House of Representatives during the Seventy-second Congress. A Senate act passed during the present congress now is pending in the House and it is hoped that favorable action may be taken there during the next session.

Isle Royale.—There is no progress to report on the Isle Royale project.

COOPERATION OF GOVERNMENTAL AND OTHER AGENCIES

It has always been the policy of the National Park Service to use the scientific and technical personnel and facilities of other Government bureaus wherever possible in the national parks and monu-

ments. During the past year bureaus of the Department of Agriculture, the Treasury Department, the Department of Commerce, the Post Office Department, the Smithsonian Institution, the General Accounting Office, and other bureaus of the Department of the Interior have rendered valuable assistance along the lines of road construction, insect infestation and other forest-disease control, sanitation, archeology, fish culture, accounting, and the expeditious handling of park mail. Special mention should also be made of many cooperating in scientific research.

Generous support also has been given this office by friends outside the Government. As always, the American Civic Association earnestly and vigorously supported park ideals and principles and offered valuable advice in reorganization, legislation, and general planning. A National Parks dinner tendered to the Secretary of the Interior and national-park officials and friends on April 19 gave an opportunity for an interesting discussion of park policies.

The National Parks Association continued to keep in close touch with national-park problems, studying matters of park establishment and enlargement and rendering valuable advice. Other organizations outside of Government circles continuing to be of great assistance were the American Game Protective Association, the Izaak Walton League, the American Forestry Association, the American Nature Association, the Camp Fire Club, the American Bison Society, the Great Smoky Mountains Hiking Club, the Sierra Club, the Potomac Appalachian Trail Club.

PROGRESS IN EDUCATION AND RESEARCH

The past year has presented extraordinary conditions and problems in the field of education and research. The heavily impaired budget made necessary some curtailment of naturalist service throughout the parks and monuments. Particularly unfortunate was the forced reduction in the naturalist personnel, which came in the face of increased demands for this program. What amounted almost to a crisis was produced by the introduction during the summer of the camps of the Civilian Conservation Corps, the educational activities of which required much additional work by naturalists. In certain historical parks, however, notably at Morristown and in the national military parks, this condition has been offset by the addition of historical technicians and historical assistants who have contributed much to permanent historical programs as well as to the emergency conservation work. Everywhere the naturalist service has been taxed to the limit. In the face of these challenges the educational program has met the test in a splendid way, and despite obvious difficulties has been extended in several directions. The work has been stabilized, gains of former years have been consolidated, and the experimental

service in connection with the emergency conservation program inaugurated and developed with more success than at first had been expected.

THE EDUCATIONAL ADVISORY BOARD

The Educational Advisory Board held its annual meeting on February 29, 1933. The theme of conservation, as exemplified in the program of the national parks and monuments, ran through the entire session. The advisory board was particularly helpful in suggesting ways and means of dealing with the rapidly developing historical field, in anticipation of the dedication on July 4, 1933, of the first national historical park, at Morristown, N.J., and of the imminent transfer on August 10, 1933, to the Department of the Interior of the national military parks and other areas of a historical nature previously under the War Department. The effect of this transfer was to make the new Office of National Parks, Buildings, and Reservations the principal Federal agency for historical conservation. Dr. Waldo G. Leland, the member of the board representing historical organizations, and Dr. L. V. Coleman, Director of the American Association of Museums, who was invited to be present and participate in the discussions, each pointed to the awakening interest in the preservation and the interpretation of historic sites, and discussed the development of adequate technique for the proper control and exploitation of such areas. The advisory board expressed an interest in a national program for surveying this problem, the matter being left for development in the hands of Dr. Leland and the chief historian of this office.

TRIPS AFIELD AND CAMPFIRE LECTURES

Public interest in the longer trail trips, especially the all-day hikes, has continued to an extent which has made it difficult to provide adequate supervision for them. For instance, 120 persons appeared one morning recently in Yosemite for the all-day hike. In certain instances during the past summer, park superintendents and naturalists have found it actually necessary to take measures to offset this tendency by encouraging short early morning and evening hikes to places of special interest, as for example, to the botanic gardens in Yosemite. Consequently, moonlight and sunrise hikes became popular in the Yosemite during the latter part of the summer, and can be developed in the other units of the system. A feature hike is that across the floor of Kilauea Crater in Hawaii, "The World's Wierdest Walk." Trips afield are gaining, not losing, in popularity.

Auto-caravan expeditions continue popular, especially in the large western parks, while "sea caravans", where opportunity is afforded to study sea life, and "meteor trips" to the top of Cadillac Mountain for observing meteor showers, are recent innovations greatly enjoyed

by visitors to Acadia National Park. The naturalist at Acadia also enjoys the distinction of being the first member of the educational staff to talk on board a United States battleship, the *Indianapolis*. Thus the educational service has been carried to sea as well as on land.

A game-stalking caravan has developed into a regular feature of the service, especially at Yellowstone. Ranger-naturalists in Lassen Volcanic National Park made daily trips to the top of the volcano. The party starts as an auto caravan, parking the machines at Lake Helen and from there proceeding on foot to the mountain top. The naturalist then stays on top, contacting all those who ascended the peak, while another naturalist is conducting a party to either Bumpas Hell or to the lava tubes, 15 miles outside the park—a trip which attracted hundreds of visitors. Glacier's auto caravan from the Avalanche Camp grounds to Logan Pass on the new transmountain highway, conducted in the same way, was more popular than ever. The trip around the rim of Crater Lake with its many scenic lookout points continues to attract thousands. Everywhere the auto caravan is meeting with growing success.

In connection with the emergency conservation program the naturalists and historians have developed programs designed to give the men in the camps general familiarity with the area of their work and with park administration. Special instruction in forestry, geology, and history has been offered with fine results. In many instances the men have been loaded into Army trucks and hauled long distances or taken on long hikes in order to give them first-hand information on natural phenomena, trees, flowers, insect life, archeology, and history. Motion-picture displays and campfire talks also have served to make the emergency conservation program interesting.

"Bigger and better campfire amphitheaters" appears to be the slogan in several of the national parks, notably in Sequoia, Grand Canyon, Acadia, Zion, and Glacier. Much is done for the comfort of those who attend lectures at Mesa Verde, where, in the attractive new amphitheater, canvas pads are furnished to the visitor and special drafts, after the fashion of the ancient kivas, keep the smoke going up vertically. Attendance at campfire programs continued strong, sometimes as many as 3,000 being present in the larger parks on a single evening; young and old enjoying the varied programs of music, lectures, and nature talks.

A special type of educational service has been the development of pageantry in the interpretation for the visitor of the spirit of various parks. For the dedication of the new Wawona Tunnel at Yosemite the park naturalist prepared a pageant of progress, portraying the early history of Yosemite Valley. To celebrate the opening of the new transmountain road in Glacier, a colorful Indian pageant was

arranged. Three local tribes of Indians encamped on the pass and in full regalia smoked the pipe of peace, a fitting celebration for the International Peace Park. At Sequoia an operetta was presented on July 4, written by Lloyd Stone, and at Mesa Verde, through the assistance of Mrs. C. Marshall Finnan, another in a series of beautiful pageants depicting the prehistoric life of that region was presented late in July before a large audience, one of the visitors being Mrs. Harold L. Ickes, who gave a colorful and interesting talk as part of the program.

MUSEUM DEVELOPMENTS

The year has been marked by noteworthy achievements in museum expansion. At Grand Canyon, the Wayside Museum of Archeology has been completed and opened to the public, with a trained archeologist in charge. In Yellowstone, the development of the roadside exhibit program has continued with splendid results. Interesting examples of such exhibits deal with the rhyo-travertine formation, and with the beaver in explaining a beaver dam. The latter portrays vividly the relationship of the beaver to various aspects of American history—as, for instance, the fur trade—and explains the life history and habits of the animal. Several of the older museums have undergone changes and improvements. In the case of the Mammoth Museum at Yellowstone, a new geology room has been added and the basement remodeled to house the library. At Fishing Bridge Museum and at Mount Washburn Lookout in Yellowstone, long-range telescopes have added to the enjoyment of the visiting public.

An important museum project pertains to Glacier National Park, where it is hoped several buildings will be erected. A large building at Rocky Mountain to be used as a historical and ethnological museum awaits installation. At Mount Rainier National Park also there is need of better housing. Improvements have been made at Petrified Forest and Casa Grande and with new headquarters at Montezuma Castle, Tumacacori, and Aztec Ruins will come the need for installation of exhibits. The museum expert will need additional help to facilitate this rapidly growing program in three major parks and in the southwestern monuments.

The Sinnott Memorial in Crater Lake National Park was opened to the public during the summer, although installation of exhibits had not been completed. Through telescopes and parapet exhibits the visitor to that museum is enabled to view closely the finer features of the park and gain an understanding of the story told by the rocks. A leaflet giving a diagram of the station and a description of the exhibits is handed each visitor. All field trips start with a lecture given in the station and a naturalist gives lectures at set times during the day. In an effort to lead the observer to a more complete appreciation of the beauty of the scene, a committee of three men from the

University of Oregon spent 3 weeks on the ground to work out the best type of plan for presenting the esthetic features. The supporting exhibits for the interior room still await installation.

Yavapai Station at Grand Canyon functioned better than ever before. It has been found that a simple explanation of how to use the station brings better results than a formal lecture. Several improvements have been made in the presentation of exhibits. A revised leaflet giving a copy of all labels is now available in addition to the one describing the method of using the station.

The museum losses sustained when Grand Canyon Lodge burned have not been replaced. A room full of exhibits, including a relief model, were totally destroyed.

At Yosemite improvements have been made in the museum and the branch at Mariposa Grove completed. Some improvements are contemplated at Glacier Point and a station for the study of granite is to be arranged on Sentinel Dome.

In the East the historical museums at Colonial National Monument and George Washington Birthplace National Monument are gaining strength. With the addition of the nationally famous Washington's Headquarters at the Morristown Historical National Park, rare furniture, manuscripts, and other Washingtonia valued at thousands of dollars were included through the generosity of the Washington Association of New Jersey. The new military and other historical areas recently transferred to the jurisdiction of this Office have provided other noteworthy museum acquisitions, notably the Lee Mansion in Arlington. In the West, Yellowstone, Glacier, Rocky Mountain, and other parks have continued to accumulate interesting historical objects, especially in Indian artifacts. The planning, preparation, and installation of museums is receiving much more attention than in the past, with the result that museums now serve in most cases to give the visitor an excellent interpretation of the significance of any given area. This Office as yet lacks the funds for adequate museum personnel, and for large models needed to give the visitors graphically the best interpretation possible of the extent and relationship of the chief features. This is especially important in connection with our plans for better understanding of the national military parks.

WILD-FLOWER DISPLAYS

In the last annual report of the National Park Service, attention was called to the tendency to abandon cut-flower exhibits and to develop instead permanent botanic gardens. This year the creation of the botanic garden at Old Faithful Museum in Yellowstone and the gardens near the crater rim at Crater Lake indicate that other steps have been taken in this direction. The new garden at Yosemite, provided through the interest and generosity of Miss Marjorie Mont-

gomery Ward, presented a real spectacle in its first year of bloom. This garden is improving rapidly under expert supervision. Wild flowers are characteristic of practically all parks and monuments and the public shows continuing interest in learning about them. Even park companies are aiding by planting gardens of native wild flowers. The Ahwahnee Hotel in Yosemite has developed a particularly fine showing of native wild flowers.

SELF-GUIDING TRAILS

Glacier continues the leader among the parks in the development of nature trails where five are functioning. There is no question as to their value, but the upkeep is proving a problem. There is continuous loss of markers by theft and other vandalism necessitating constant replacements. No outstanding new trails have been developed during the year though several are planned.

UNIVERSITY FIELD CLASSES AND THE VISIT OF INTERNATIONAL GEOLOGICAL CONGRESS

Different universities and colleges continued to send field classes to the various park and monument areas, though the curtailment of funds somewhat reduced the numbers. At least a dozen universities and an equal number of teachers' colleges sent students into the parks on study trips. In addition, organized tours of students numbered at least six.

An epochal event during the past season was the meeting in Washington, D.C., of the International Geological Congress, followed by a tour of several of the national parks and monuments, and other points of interest in the Southwest and far West. Park naturalists at Grand Canyon, Zion, Yosemite, Crater Lake, Carlsbad Caverns, and Yellowstone met the distinguished visitors and helped explain scientific features. One ranger naturalist at Crater Lake displayed conspicuous versatility, lecturing to one party in three languages.

YOSEMITE SCHOOL OF FIELD NATURAL HISTORY

The Yosemite School of Field Natural History, a training school for naturalists desirous of entering national park work, held its ninth session. A very fine group of 20 graduate students—12 men and 8 women from 8 different States—was enrolled. New features added to the school's curriculum were the use of pack animals on the week's trip in the High Sierra and a biological survey of a proposed research reserve. Instructors recruited from four of the Nation's principal universities comprised a notable instructional corps. Attendance at the Yosemite Junior Nature School reached a new record of 379 different children and an average of 74 at each session. This continues to be the only specialized service to children.

LIBRARY DEVELOPMENTS

Progress has been made during the year in the development of adequate library facilities for all areas under the jurisdiction of the Office of National Parks, Buildings, and Reservations. Books and important manuscript materials, as well as some old newspaper files, have been collected, and noteworthy steps are being taken to classify, with the help of the American Library Association, all accessions. Like the museum, the park library is a great help to the complete interpretation and understanding of the area. Perhaps the outstanding addition of the year is the collection of letters written by Washington during his stay at Morristown, as well as others to him, which were donated to the Morristown National Historical Park at the time of its creation.

In Yellowstone, new quarters for the library have been provided in the basement of the museum at Mammoth. The fine collection of books is now fully catalogued, and was made accessible to the public this past summer. Yosemite's library continues to grow in size and use. Mesa Verde's probably comes third in size, but proper housing has not been provided.

Through the interest and help of the national parks library committee of the American Library Association, headed by Mr. C. E. Graves, a development program has been outlined and an effort is being made to gain financial support for a master library and proper personnel. Library development has not kept pace with the educational program and there is great need for promoting this feature of the service.

SCIENTIFIC RESEARCH

The work of the naturalist-historical service of this Office is not primarily to conduct pure research. Its primary problem rather is the direction, extension, and correlation of research in order to secure a basis for proper interpretation of scientific features. Consequently the naturalist and historian carry on such research as is indispensable to their work, and at the same time avail themselves as far as possible of the results of the research of others which bear upon their situation, and they seek in every way to promote research which will be helpful in solving scientific problems.

Various governmental, semipublic, and private agencies have continued to aid materially. Dr. A. P. Meinecke, of the Bureau of Plant Industry; Dr. T. S. Palmer and Dr. O. J. Murie, of the Bureau of Biological Survey of the United States Department of Agriculture; Mr. Harry Hommon, of the United States Public Health Service; Dr. A. S. Hazard, of the Bureau of Fisheries; Dr. J. C. Merriam, of Carnegie Institution; Dr. Alexander Wetmore, of Smithsonian Institution; and Dr. Waldo G. Leland, of the Council of Learned Societies have each of them personally, and through the organizations

they represent, assisted the work of the national park program. A group of the chief historians of the Nation studied with us the problem of inaugurating the historical policies which led to the creation of Morristown National Historical Park, among them Dr. J. Franklin Jameson, of the manuscripts division of the Library of Congress; Dr. John C. Fitzpatrick, editor of the bicentennial edition of the Writings of George Washington; Dr. Evarts B. Greene, of Columbia University; Dr. Edmund C. Burnett, of Carnegie Institution; and Dr. Samuel F. Bemis, of George Washington University. Dr. Charles Moore, of the Fine Arts Commission, has given generously of his time to the careful investigation of many problems relating to the work, as has Mr. H. P. Caemmerer, the secretary of that Commission.

Investigations range in subject matter all the way from fine arts and history in the District of Columbia and vicinity to geology, plant and fish life, and archeological excavations in the Southwest and far West. In the latter connection, the work of Jesse L. Nusbaum, of the Laboratory of Anthropology at Santa Fe; Earl Morris, of Carnegie Institution; Dr. Harold S. Colton, of the Museum of Northern Arizona; and Dr. Neil Judd, of Smithsonian Institution have been outstanding in numerous matters which have been referred to them.

Dr. H. P. Mora, of the Laboratory of Anthropology at Santa Fe, examined various ruins at the Petrified Forest National Monument and studied the Flattops for ruin sites. He found evidences of pit houses on the large mesa and a considerable number of Hohokam shards of plain ware. This is the first time, according to Dr. Mora, that the Hohokam pottery has been found so far north. The various pottery found by him seems to show a mingling of cultural influences from the east, south, and west.

The Museum of Northern Arizona has continued archeological research in the ruins of Wupatki National Monument. The University of Arizona has begun reconnaissance work in the Verde River Valley adjacent to Montezuma Castle National Monument. The Museum of New Mexico, School of American Research, and the University of New Mexico have jointly continued excavations at Chetro Kettle in the Chaco Canyon National Monument.

It should be added that as an incident to the emergency conservation work the addition to the staff temporarily of several trained investigators in historical research and landscape architecture has made possible the development in several of the major historical areas a tremendous amount of new and important data which will be of permanent value in the educational program.

Dr. John C. Merriam, president of the Carnegie Institution, has continued studies on the scientific features of various parks and

methods of presenting the findings of scientists to the general public. With financial aid made possible by Dr. Merriam a committee of three men, headed by R. W. Leighton, chairman of research in the University of Oregon, have been studying ways of presenting the beauty of Crater Lake in such a way as to have the public appreciate it. Other grants of aid have made possible studies of the Algonkian rocks of Grand Canyon by Messrs. I. N. Campbell and John H. Maxon, of California Institute of Technology, and by Dr. Hines, of the University of California. Dr. Hines also spent some time on volcanological problems in Crater Lake National Park.

Dr. H. C. Bumpus continued studies of educational methods in Yellowstone and revised Trailside Notes, a unique and useful guide for the motorist driving around the loop. Small illustrations call attention to the main scenic and scientific features.

The University of Michigan initiated a geographic survey of the Grand Teton region, and the University of Chicago the geology of the western slope of the Tetons. The work of a sizeable group of scientists connected with the expedition to Rainbow Bridge and Monument Valley arranged by Ansel F. Hall, of the National Park Service, should receive emphasis as producing much valuable scientific data on this region. Studies of granites have been continued in Yosemite by Dr. Ernst A. Cloos, of Johns Hopkins University. Dr. A. E. Douglass, of the University of Arizona, has carried forward some noteworthy investigations in tree rings in the Southwestern monuments, which has led to the tentative dating of several of the principal prehistoric ruins at Mesa Verde. Dr. Field, of Princeton University, has had two students to continue work on the geology of Yellowstone National Park. Dr. H. E. Gregory for the United States Geological Survey continued geological studies in Zion National Park. Several field sections of the International Geological Congress visited several national parks. The presence on the ground of these widely known scientists brought forth new explanations and theories regarding phenomena and technical problems relating to geology.

There were many other eminent scientists who visited the national parks pursuing independent investigations. Among these were Dr. W. W. Atwood, of Clark University, who continued glacial studies in Crater Lake, and Lewis Williams, of the University of Wyoming, who studied the flora of Grand Teton National Park.

NATIONAL PARK EXHIBITS AT A CENTURY OF PROGRESS

This Bureau was extremely fortunate in being represented at a Century of Progress Exposition by exhibits in two of the most interesting and widely visited buildings at the fair—the Hall of Science and the Federal Building. An average of nearly 30,000 persons

visited these exhibits each day. At the close of the fair, nearly 5,000,000 persons, many of whom had only the most vague ideas of the Nation's system of national parks and monuments, had examined these interesting and instructive displays.

The exhibit in the Federal Building was visited by the largest number of persons. Its principle feature was a model of Mount Rainier, 20 feet wide and 12 feet high, showing the Nisqually Glacier. Automatic lighting reproduced the 24-hour cycle of light changes on the mountain, the glacier was represented by real ice, and a snow storm that stopped itself in 3 minutes could be started at the will of the operator. A typical model of a national-park camp-fire group being entertained by motion pictures was shown at the side. The motion-picture feature of the model was real, though the screen was small. The reels were changed daily, and in this way most of the parks and many of the monuments were strikingly presented to thousands of exposition visitors. Other educational material in this booth included a large map of the United States showing the location of all the national parks and monuments, and 39 of them were represented by oil-painted scenes of great beauty. Copies of all national-park publications and a collection of splendid photographs showing wild animals and beautiful scenery were displayed on a rack. A unique feature of the Federal Building exhibit that turned out to be a splendid advertising medium were six great log benches installed for the comfort of visitors who wished to watch the changing lights on Mount Rainier and the motion pictures. These benches were made from a great ponderosa pine cut in the Grand Canyon region. Many visitors acquired the habit of using the booth as personal headquarters and "We will meet you at the log benches", was a remark often overheard in the Federal Building.

This exhibit in the Hall of Science consisted chiefly of models presenting the geological features of nine national parks and the Petrified Forest and Rainbow Bridge National Monuments beautifully displayed with indirect lighting. Appropriate motion pictures were exhibited on a large screen arranged in an alcove. The parks represented were Bryce Canyon, Carlsbad Caverns, Yellowstone, Grand Canyon, Grand Teton, Hawaii, Mesa Verde, Rainier, and Yosemite. Also in the Hall of Science, but not in the national-park group, were relief models of Crater Lake and Glacier.

The exhibits were in charge of experienced national-park men in uniform, who took advantage of every opportunity to serve visitors in a personal way. Much valuable contact work was thus accomplished. A large number of persons who had planned to visit only the Fair extended their itineraries to include one or more of the western parks.

ANIMAL CONDITIONS

The national parks and national monuments are looming ever more important in the wild-life situation of the United States as the encroachments of civilization render the existence of wild animals increasingly precarious. Even in the parks and monuments, mere protection has ceased to be enough. It is necessary to make specific studies of conditions necessary to animal welfare, and to this end the Division of Wild Life Studies was established last year as a definite division of this Bureau.

For several years wild-life studies were carried on with personal funds contributed by George M. Wright—now chief of the new division—as a personal contribution to the work of the National Park Service. Last year it was possible for the Service to bear nearly half the expenses of these studies. It is therefore especially gratifying to announce the establishment of the division the past year on a full-time Government basis.

Two reports of the investigation of the division were made available for distribution. The first, entitled "A Preliminary Survey of Faunal Relations in National Parks", gives a review of the wild-life problems of the park system and outlines a conservation policy to be followed. The other, "History and Present Status of Breeding Colonies of the White Pelican in the United States", was issued in rotaprint, only 1,000 copies being available.

As a result of studies at the Petrified Forest National Monument, plans are now under way for the development of this area as an outstanding antelope range through the erection of stock-proof fencing and the provision of water holes. It was found to be an ideal natural habitat for this plains animal. Several hundred antelope now range in the vicinity of the monument. Study of the Grand Canyon National Monument developed the fact that antelope should be reintroduced in that area when general development plans can be undertaken. The antelope herd on the Tonto Plateau in the Grand Canyon National Park increased to 28 with the addition of 8 kids.

Studies of the Bandelier National Monument in New Mexico indicate that this area under park supervision gives promise of becoming one of the outstanding regions in the Southwest for the development of natural game conditions.

The special protection given trumpeter swans in Yellowstone National Park for several seasons resulted last summer in the return of these great birds to Swan Lake, a body of water which, despite its name, they have neglected for many years. Since the lake has little cover for the birds, their use of it indicated an increase in numbers, and a spreading to less desirable locations. Swan Lake is one the

main loop road and thousands of visitors have been thrilled by the sight of the swans, followed by their cygnets, swimming across the lake. Canada geese continue to nest in large numbers. The pelican colony on Lake Yellowstone is thriving.

A series of dry years has resulted in poor forage for the northern herd of Yellowstone elk which winters near the Gardiner entrance. Park officials express the fear that, in spite of extensive feeding, a considerable loss will result if heavy snows are experienced during the coming winter.

In the 1932 annual report of the Director of the National Park Service mention was made of bear-control measures undertaken in the Yellowstone. As a result, injury to persons and property by these animals was greatly reduced during the past season and a number of isolated camp grounds were again in use. An effort will be made still further to reduce trouble by installing bear-proof garbage cans and food safes, thus removing the main incentives to bears to enter the camps. A new fence at the canyon bear-feeding grounds now gives increased protection to the crowd which nightly gathers to see the anywhere from 15 to 30 grizzlies feed. Unquestionably Yellowstone provides the greatest grizzly show on earth. Yellowstone visitors who took the advice of the new sign reading "Look for Moose" were rewarded in large numbers last season, so abundant has this great game animal become.

An interesting observation from Mount McKinley National Park, where an increase of all park animals was reported, is that the caribou, mountain sheep, and moose fare better in extremely cold weather with a light snowfall than in moderate winters with heavy snows. Last winter the caribou remained in the park for the first time in several seasons. Animal life in Glacier National Park also is showing a large increase and Yosemite wild life had a good year.

Deer were numerous in Crater Lake National Park, although because of its limited area and the late recession of the snow cover they did not return to the park until very late in the season. If these animals are to be made a major attraction to Crater Lake visitors, an extension of the park to the west or enforced protection during the winter months is necessary. The disappearance of white-tailed deer in Yellowstone is still difficult of explanation.

From Hawaii National Park comes the report that while the number of birds—the only native animal life in the park—is increasing, meantime many of the more important native species have become extinct. Introduction of birds from other sections of the world, continually carried on in the Hawaiian Islands, it is feared, will eventually result in the native birds being crowded out.

FISHING AND FISH-CULTURAL OPERATIONS

Improvements and investigations relating to fish culture were somewhat limited during the year owing to curtailment of funds. Nevertheless a limited survey was carried on in Yosemite National Park, principally of the Merced and Tuolumne Rivers by specialists of the United States Bureau of Fisheries as part of a cooperative arrangement between that bureau, the State of California, and the National Park Service. Investigations also were made of various waters in Yellowstone, Glacier, Grand Teton, and Sequoia National Parks.

Completion of the Bureau of Fisheries hatchery at Silver Springs, near the north boundary of Mount Rainier National Park last fall provided facilities for stocking park waters with trout. The capacity of the hatchery at present is 750,000 trout, and enlargement can be made when necessary and as funds are available.

Excellent fishing conditions were maintained in all parks, with continued improvement noted in several. The national parks provide as fine fishing as can be found anywhere in the United States. It should be the best in the country and it will be my purpose to make it that.

The collection of 28,234,000 black-spotted trout eggs at the Yellowstone hatchery exceeded previous years, with the possible exception of 1922. Of this, over 8,000,000 eggs were retained at the Yellowstone hatchery for planting in that park and 1,000,000 eggs each were sent to Glacier and Grand Teton National Parks, the State Fish hatchery at Ashton, Idaho, and the Federal fish hatchery of Bozeman. Those to the Ashton hatchery were for planting in the Bechler River section of Yellowstone Park and those to the Bozeman hatchery, waters on the west side of Yellowstone Park. These two shipments were necessary by reason of congestion of the Yellowstone Lake Hatchery and to eliminate longer trips in distributing the fish. Three hundred thousand eggs were also sent to Mount Ranier National Park. Large fingerling also were planted in the park from the rearing ponds at Mammoth Hot Springs and the Federal fish hatchery at Bozeman.

An outstanding development in Yellowstone Park was the successful handling of grayling eggs at the grayling hatchery erected during the year at Grebe Lake. A total of 2,118,400 grayling eggs was collected and hatched 94.4 percent, this being so far as known the all-time record for the hatching of grayling eggs. Grayling also were found definitely established at the head of the Illiouette Basin in Yosemite Park and it is hoped within a few years the supply will be adequate for fishing. Fine grayling fishing was reported from Glacier, as in past years.

Planting of eggs was continued in Crater Lake, General Grant, Great Smoky Mountains, Sequoia, and Yosemite National Parks through the cooperation of Federal and State hatcheries.

No fish were planted in the Grand Canyon National Park during the year as the Bright Angel Creek was approaching a point where an oversupply of fish might occur. In this stream, a supply of live freshwater shrimp was introduced to augment the natural food supply.

During the year results were made available of a biological survey made of conditions in Glacier National Park last year by the United States Bureau of Fisheries, and fish plants in the park were made in accordance with the facts disclosed by the survey.

PROTECTION OF PARK FORESTS

The past year in forestry has been marked by unexpected accomplishments in many forestry activities, largely through the assistance of the Civilian Conservation Corps.

Successful campaigns were waged against forest insects. Several epidemics of major importance were either stamped out or reduced to a point where annual maintenance control will prevent further losses. Among these were the serious bark-beetle infestations in the pine belt in the southeast portion of Yosemite National Park and on adjacent national-forest areas, controlled at a total cost of more than \$30,000. A similar bark-beetle epidemic in the northwest section of the Yosemite remains uncontrolled, but the Forest Service has received a large grant of the public-works funds for control measures on the adjacent forest and it is hoped funds also will be available for use in the park. Infestations in Crater Lake were brought to a point where comparatively inexpensive annual maintenance only is necessary. A rapidly growing mountain-pine beetle infestation in mature stands of lodgepole pine in the Hockett Meadow district of Sequoia Park also was eradicated.

Weather conditions played a large part in the reduction of bark-beetle attacks in the northwestern States and part of California.

Nevertheless, there still remain two great areas in Yellowstone and Glacier Parks where the magnitude of the infestation apparently places it beyond human control. The infestations center in the parks and extend out into the surrounding forest areas. Investigations of these regions last year indicated that the cost of control probably would run up into the hundreds of thousands of dollars without positive assurance that successful control would be possible. The heavy freeze of the winter of 1932-33 killed many of these beetles, however, and as this report goes to press, careful surveys again are being made over both areas to ascertain the practicability, in view of this development, of now undertaking control.

Control of the white-pine blister-rust was continued in Mount Rainier and Acadia National Parks and preliminary ribes eradication started in the California parks. This disease is spreading rapidly, both in the northern Rocky Mountains region and in the Far West.

Unless checked, it is only a matter of time before it will reach the white-pine stands in Glacier National Park and the forests of sugar pines and other white pines of the California parks. Anticipating this apparently inevitable infection, surveys are being made in Crater Lake, Yosemite, Sequoia, and Lassen National Parks to determine the distribution of the white pines and the occurrence of current and gooseberry bushes.

In the field of fire-protection, great advances were made in prevention, and also in detection and suppression. As a result of these factors, most of the fires that broke out in national parks were immediately controlled and held to a minimum acreage.

Another extremely important forestry activity in which great progress has been made during the year is the preparation of the forest-type maps which are so essential in planning for insect and blister-rust control and other important operations.

In addition to the broad forestry problems handled, as indicated above, attention also was given many detailed problems. Interesting among these was the protection given the famous General Grant tree, in the national park of the same name. Flood channels exposing the roots of this tree were filled during the fall of 1932 and a diversion ditch constructed to carry the water along the upper slope to a safe point beyond the tree. A swale within the protective railing also was filled with many truckloads of earth, protecting the southern exposure of the base.

PLANNING AND PRESERVATION OF PARK LANDSCAPE

Increased use of the national parks and monuments in recent years had made necessary ever-watchful planning to preserve the natural beauty of these areas. To this end a corps of architects, landscape architects, and engineers is kept busy throughout the year.

The Office of National Parks, Buildings, and Reservations has planned ahead on its developments and has established a 6-year development program in accordance with the Employment Stabilization Act. Though not yet in their ultimate form, master plans for each park, developed in cooperation between the park superintendent, the landscape architects, and the engineering staff proved of invaluable assistance in enabling this office to submit immediately, in connection with the public-works program, an outline of national-park development accompanied by plans, estimates, and justifications. They have also served many other purposes and their use is on the increase.

The master plans were commenced 2 years ago. A year ago plans were completed for all but five of the western parks and some of the monuments. This year plans were completed for all of the remaining western areas and the first year's editions brought up to date.

Master plans will be brought up to date each fall, showing status of developments at the end of the preceding construction season. The eastern national parks are now being studied but the master plans have not been prepared. It is hoped that by the end of the year a good many of the master plans will be completed for the eastern areas.

These plans show the entire development scheme for the area affected and embrace a wide variety of subjects, including the road-and-trail systems, fire-control plan, developed and special areas, general layout of each tourist and administrative area, utilities plans of each populated area, parking areas, relocation and arrangement of future buildings, and sheets of typical details such as guard rails and culverts.

Special attention has been given to location and design, with the ready assistance and cooperation extended the office by the Bureau of Public Roads. Much study has been made of road sections. Among other results, the rounding and flattening of cut slopes has resulted in improved appearance and lower maintenance costs on roads. Though in use but 4 seasons, this treatment is already widely adopted by other road-building agencies. Study is also being given to road shoulders, width of slopes, and size and type of ditches and drainage structures.

A variety of buildings, bridges, gateways, tunnel portals, and similar structures were constructed during the year from plans and specifications prepared by the architects, each carefully planned for its particular site. Through gradual raising of building standards, this year's buildings represent the best yet obtained in the parks.

The speedily launched President's emergency conservation program as applied to the national parks necessitated very careful consideration of landscape problems.

WINTER USE

Use of the national parks and monuments during the past winter was marked by an increased interest in all forms of winter sports, but notably in skiing. Sixteen of the national parks were open all year, with varying types of accommodations, ranging from hotel and lodge service to camp grounds for travelers carrying their own equipment.

Popular demand for improved winter-sports facilities in the mountain parks is constantly increasing, and every possible consideration is being given to these demands for enlarged usefulness of the national parks. However, careful study of every angle of the problem is being made, and we are proceeding very slowly in the hope that few steps will have to be retraced.

Yosemite National Park experienced the usual heavy winter travel, which reached its peak during the annual Yosemite San Joaquin-Sierra Winter Sports Carnival. As in the past, Governor James Rolph attended and took an active part in the picturesque ice pageant that featured the carnival program.

Looking toward future developments in Yosemite, the park operator has recently made a special study of winter sports in the leading resorts of this country and Europe. This study has yielded information that will be of basic importance in developing winter-sports policies. It reveals that skiing is the basis of such activities throughout the world, and that the finest areas for this sport in Yosemite National Park are above the 8,000-foot level. The most important factors in selecting ski fields are open slopes, deep snowfall, consistent low temperatures, and the quality of the snow. There are many such areas to be found in national parks, and the cream of those existing in Yosemite are believed to be in the region beginning at Snow Creek and extending to the slopes of Mount Hoffman, Tenaya Peak, and Sunrise Pass. Many skiing experts state that there are slopes in this region comparable with the finest runs in Europe.

Winter sports continued to increase in popularity in Mount Rainier, where the toboggan slide at Longmire and the ski fields in the Paradise Valley region attracted large numbers of winter visitors. The second annual Snow Sports Carnival of the Seattle Junior Chamber of Commerce was held April 1-2. With perfect weather and Mount Rainier for a background, this was a spectacular and colorful affair attracting large numbers of visitors.

In spite of severe winter weather, Crater Lake National Park experienced a slight increase in travel. This is regarded as representing a greatly increased public interest in the park that under favorable conditions would have resulted in a much greater travel increase. The Crater Lake Caravan, sponsored by the towns of southern Oregon, visited the park on April 23. Though the snow averaged 20 feet in depth in some places, nearly 400 cars made the trip to the lake rim, where special parking places had been cleared. Ski contests, under the direction of the Crater Lake Ski Club, featured the program. The policy of keeping the road to the rim open during the winter has aroused a new interest in this park, as Crater Lake in winter garb is a beautiful and inspiring spectacle.

The Colorado Mountain Club held its annual winter outing at Fern Lake, and a large number of skiing parties visited the east side of Rocky Mountain National Park. This park has long been a favorite with winter-sports enthusiasts. Emergency conservation labor is used to build a winter-sports area in Moraine Park, and a fine ski hill will be a feature of this undertaking.

The road to Giant Forest in Sequoia National Park was maintained in good condition during the past winter, and this combined with deep snow and good weather encouraged winter travel. Nearly 6,000 persons visited the park during February, a substantial increase over the number recorded for the same month in the preceding year. Snow sports brought 20 percent more winter travel to General Grant National Park than recorded for 1932.

The south rim of the Grand Canyon is visited by large numbers during the winter months, and though winter travel to that area declined during the past year, at the end of April nearly 21,000 visitors had been recorded for the period beginning October 1.

Though it is generally regarded as off the beaten track, thousands of people visited Zion Canyon National Park each winter despite the fact that from the middle of October to the middle of May no accommodations are available except camp sites. The customary quota was recorded this year.

Carlsbad Caverns received 13,002 visitors for the period from October 1 to April 30, a decrease over the preceding year. This was undoubtedly due to the general decline in transcontinental travel.

Hawaii National Park experiences heavy winter travel, and this year it amounted to 72,487. Though the total travel for the winter period was less than that recorded in 1932, it is interesting to note that travel for April this year was nearly double that for the same month last year. This year there were 14,000 visitors during April and last year 7,554.

In spite of unfavorable conditions throughout the country, nearly 90,000 persons visited Hot Springs National Park during the winter season. The balmy Arkansas climate makes this reservation a popular winter resort. It should be better patronized.

No official count is made of travel to the Great Smoky Mountains National Park, but the superintendent reports that travel to that park, which is convenient to the large centers of population is greatly increasing at all seasons of the year.

Wind Cave, Lassen Volcanic and Platt National Parks experienced a travel decrease that was regarded as normal under prevailing conditions. Acadia National Park in Maine, as usual, remained open all year, but no official travel count was kept.

Many of the national monuments are located in regions that enjoy mild climates and consequently experience considerable winter use if road conditions are at all favorable. This is particularly true of many of the monuments of the Southwest, and special interest has centered in Petrified Forest National Monument since the bridging of the Rio Puerco and the addition of the Painted Desert section to this monument. Travel to this reservation from October 1 to April 30 totaled 49,234.

Winter travel to Muir Woods National Monument in California amounted to nearly 20,000. The only two national monuments in the East, Colonial and Wakefield in Virginia, experience heavy winter travel on account of the mild climate and their proximity to the highways between New York and Florida.

PUBLICATIONS AND VISUAL MATERIAL

This Office was handicapped during the year in its efforts to meet increased demands for literature by the fact that its printing fund was the lowest in nearly 10 years.

Limited editions of the various national-park circulars of general information with the exception of those for Grand Teton and Mount McKinley National Parks were issued. This year for the first time an individual circular of general information was issued regarding the Carlsbad Caverns National Park, using the offset process. A total of 455,000 general-information circulars was issued.

To augment the editions of information circulars it was possible to print motorists guides for Crater Lake, Glacier, Mount Rainier, Rocky Mountain, Yellowstone, and Yosemite National Parks. In all 184,000 of these guides were printed and practically all of them forwarded to the parks and distributed to motorists as they entered these areas.

With the influx of thousands of boys into our national parks under the emergency conservation program it was the opinion of Director Robert C. Fechner of emergency conservation work and officials of this Office that special information on our national parks should be available to familiarize these boys with the areas in which they were working. To meet this demand a 32-page brochure entitled "The National Parks and Emergency Conservation" was issued, an edition of 50,000 copies being printed on the offset process.

A thousand copies of Occasional Paper No. 1, a contribution of the Wild Life Division of this Office, written by Ben H. Thompson, of that division, and entitled "History and Present Status of the Breeding Colonies of the White Pelican in the United States", was rotaprinted. This paper has been referred to previously.

An edition of 15,000 copies of a 12-page leaflet entitled "Desert View Drive in Grand Canyon National Park" was printed for distribution at the Grand Canyon National Park. This leaflet contains a brief description of each major feature seen from the various places visited on the Desert View Drive along the east rim of the canyon.

Reprint editions of two Grand Canyon publications entitled "How Yavapai Station Can Help You to Understand and Enjoy the Grand Canyon" and "What to Do and See in Grand Canyon National Park (South Rim)" were issued and practically all copies forwarded to the park for distribution.

To meet the increased demand for information regarding the George Washington Birthplace National Monument a small folder was rotaprinted, primarily for distribution to visitors at the monument.

Early in August 5,000 copies of a large recreational areas map, approximately 42 by 31 inches in size, were issued. On it are indicated the locations of all the national parks, national monuments, approved park projects, national military parks, national forests, and State parks and reservations. Principal connecting highways are also shown. This free map takes the place of the map of the western United States, showing the National Park-to-Park Highway formerly issued by this Office.

There has been much favorable comment in the press and otherwise regarding this map. As a result of the newspaper publicity the initial edition of 5,000 copies was exhausted in 2 weeks' time. A reprint is now being run off.

The National Conference on State Parks, State-park organizations, other bureaus of the Government, and the American Automobile Association assisted this Office in the preparation of this map. Their cooperation is greatly appreciated.

Fauna Series No. 1, entitled "Fauna of the National Parks", written by George M. Wright, Joseph S. Dixon, and Ben H. Thompson, of the Wild Life Survey, already has been mentioned.

"Plants of the Rocky Mountain National Park", by Ruth E. Ashton, is a notable addition to our publications dealing with the flora of the national parks. It has met with widespread acclaim and sets a new standard in outward appearance.

Both of the foregoing publications dealing with the fauna and flora are for sale distribution by the Superintendent of Documents at the Government Printing Office, the first-mentioned selling for 20 cents and the latter for 25 cents.

Students of national-park history will find another sale publication issued this year, entitled "Early History of Yellowstone National Park and Its Relation to National Park Policies", by Louis C. Cramton, of great value. This publication sells for 10 cents.

The national parks and monuments continued to receive a great deal of advertising through the medium of illustrated lectures, radio broadcasts, motion pictures, and magazine and newspaper references.

During the year 280 motion-picture films were lent to interested individuals and organizations, and approximately 4,000 photographs and 7,000 lantern slides borrowed from this Office.

PARK-ROAD DEVELOPMENT

In the 1933 fiscal year, the cash appropriated for road and trail work amounted to \$7,500,000, the same amount which was available in 1932. The Secretary of the Interior was also authorized to obligate

contractually on construction projects an additional amount of \$2,500,000 in 1933, as compared with \$2,850,000 in 1932. Of the \$7,500,000, the Interior Department Appropriation Act for the fiscal year 1933 made available \$4,500,000 (which includes \$2,850,000 authorized for advance contractual obligations in the 1932 appropriation act), and \$3,000,000 was appropriated by the "Emergency Relief and Construction Act of 1932."

There was made available in cash by the Interior Department Appropriation Act for the fiscal year 1934, \$2,435,700 of the \$2,500,000 which had been authorized in the previous fiscal year for advance contractual obligations, only \$1,236,273.28, however, being actually available for expenditure after compliance with instructions requiring impoundment of \$1,199,426.72. In addition, projects amounting to \$17,059,450 were approved by the Public Works Administration for a 2-year public-works program of road and trail construction.

As in the past years, the Bureau of Public Roads of the Department of Agriculture continued its excellent cooperation in major road construction in the national parks and monuments except in Mount McKinley National Park, Alaska, where the road work has been performed by the Alaska Road Commission. We especially appreciate our relations with this fine Bureau which, under the direction of Thomas H. Macdonald, is showing such splendid cooperation and results.

There have been constructed, reconstructed, and improved to date (cleared, graded, and surfaced) 644.80 miles of roads. In addition, work in various stages of construction includes 345.9 miles of clearing and grading and 161.1 miles of surfacing. Considerable progress has been made on construction of adequate trail systems, \$1,813,-372.37 having been expended on the construction of 730.39 miles of trails built on suitable standards of grade alinement. Although good progress has been made possible with the funds provided for the past several years, it is estimated that there still remain 915.72 miles of road to be constructed and improved. The total road and trail mileage is variable, however, due to the acquisition of additional areas in existing parks and monuments, and the establishment of new reservations.

Information concerning the most outstanding of the road projects appears in the summary of activities of the various parks under "The Year in the Parks."

PUBLIC-UTILITY SERVICE

The two most important subjects discussed at the fourth annual conference of the operators of public utilities in the national parks, which met in Washington last November, were the transportation and rate policies for the season of 1933. With the continued decline in

the number of visitors transported through the parks in the motor busses of the authorized operators, there has been, conversely, a steady increase in the number of visitors transported in busses entering the parks under various conditions. With this change in the trend of business, it was recognized that the regulations with respect to the operation of busses in the parks must be changed to meet changed conditions. Therefore, the park operators recommended the rescinding of all previous orders with respect to bus transportation in the parks, and the issuance of a new order embodying substantially the following provisions:

All companies or persons should be prohibited from engaging in the business of motor transportation handled directly or indirectly within the parks except those operators licensed by the Secretary of the Interior, or the following specific exceptions.

1. Commercial cars of nonprofit organizations, such as Boy Scouts, schools, etc.

2. Commercial pleasure cars rented by tourists by the week, month, etc., for a tour in which the trip to the park is merely incidental.

3. Bona fide "casual" busses carrying tourists on a contract basis when a visit to a park is an incident to a tour. (Under this ruling transcontinental bus tours visiting parks as an incident to a trip would be admitted. On the other hand, regularly advertised or solicited transcontinental tours, operating during the travel season, similar to those contemplated by the Greyhound companies for 1933 would not be admitted.)

4. Bus companies, tour agencies, individuals, and all others seeking to operate bus tours from points within the same State to a park or from nearby cities and towns from an adjoining State will not be admitted into that particular park.

Careful consideration was given to these recommendations and they were approved by former Director Albright under date of December 15, 1932.

For many years the isolation of the various parks was such that for the purpose of operation, management, and rate structures the parks were substantially economic "islands" with respect to their relationship with each other and resort operations adjacent to them. With the improvement of transcontinental highways and easy access between the parks, the relationship of the park operators to each other and to the resort operations in their immediate vicinities has become of more and more importance. A visitor traveling from one park to another quite naturally expects to find facilities of the same general standard, and he also expects to find in a national park accommodations of the same general character as those outside at comparable rates. In order promptly to meet these new conditions

as they arise it was considered desirable that the rate schedules and service, as approved by the Secretary, have greater flexibility than heretofore.

With this purpose in mind and to enable the operators to respond more quickly to the constantly changing demands regarding service facilities for accommodating the public in the national parks, former Director Albright authorized the park operators under date of December 15, 1932, to offer new service facilities during the ensuing year and to make changes in existing service on approval by the respective superintendents and the Director.

The response of the public to this slight change in policy should result in a better understanding of service requirements with their attendant problems and provide information of value in planning future utility developments in the national parks.

The majority of the operators took advantage of this special authorization and numerous changes have been made during the year. European-plan rates were established to supplement the American-plan rates generally in use in hotels and lodges. Cafeteria service has supplemented or supplanted the regular meal service in many units. Meal rates were reduced in several of the parks. Special "club" or group rates were quoted for large parties visiting the parks and reductions were made for more or less extended stays and for off-season periods.

Despite these special inducements the amount of gross revenue from operations showed a still further decline. Complete reports are not available at this time, but it is estimated that the volume of 1933 business will aggregate about one third less than that of 1932, or about 15 percent of the volume of 1929. Although it has been necessary for the operators, because of this falling off in gross revenues, to effect drastic reductions in personnel and operating expenses, every effort has been made by them to maintain the high standard of service prevailing in the national parks.

I am glad to report that the operators have complied substantially with the requirements of the National Recovery Act.

For many years the most remunerative business of park operators has been the furnishing of accommodations to the visitors delivered to the various gateways of the parks by the transcontinental railroads. With the decline in railroad travel, many of the facilities acquired primarily to take care of the railroad business are more or less in disuse. Among such facilities not in operation during the 1933 season were the Mammoth and Lake Hotels and the Lake Lodge in Yellowstone National Park, the Cut-Bank and St. Mary's Chalets in Glacier National Park, and the Prince of Wales Hotel just outside of that park on Waterton Lake in Canada.

It was gratifying, however, to note that there was a perceptible improvement during the latter part of the season, and there is every indication that furnishing of accommodations for organized tours will again become quite a factor in the business of the public-utility operators.

RADIO COMMUNICATION

The experiments in two-way radio communication, begun in Mount Rainier National Park by R. D. Waterhouse, associate engineer, were continued during the past year with very satisfactory results. A full-time expert was employed during the summer season and the program had the following objectives:

1. Reliable communication between district ranger stations and headquarters to supplement interrupted telephone service.

2. The development of a light portable telephone set for use by smoke chasers and during fires.

3. Combined telephone and radio communication.

The first objective has been obtained with perfect success. Day after day, in all seasons and all kinds of weather, district rangers and fire lookouts have maintained regular communication with park headquarters.

A portable model has been developed and tested, but certain refinements and more power with less weight are being sought. The radio department of the University of Washington is cooperating in conducting research along these lines, and experimental sets are being constructed by the park radio division and two radio operators formerly employed in the park.

Communication by means of combined use of the radio and telephone has been developed satisfactorily, and can be put into practical use whenever funds are available.

Experimental tests made between San Francisco, Seattle, and Mount Rainier Park, an airline distance of approximately 900 miles, resulted in code signals from the SP set in San Francisco being received with good volume in Seattle and the park. Voice signals from Seattle and the park were audible in the headphones with fair volume in San Francisco.

APPROPRIATIONS AND REVENUES

The appropriations made available to the National Park Service in the 1933 fiscal year totaled \$10,640,620, but in compliance with the restrictions contained in the Economy Act (Public No. 212, 72d Cong.), and the act "To maintain the credit of the United States Government" (Public No. 2, 73d Cong.), the amount actually available for expenditure was reduced to \$10,319,272.54, or by \$321,347.46. Of the total appropriated, \$3,000,000 was provided for road and trail construction in the "Emergency Relief and Construction Act of

1932" approved July 21, 1932. In addition to the total appropriated funds indicated above, \$1,956,000 was made available for emergency conservation work during the fiscal year 1933, including \$770,000 allotted for work in State parks.

Cash donations to the national parks and national monuments for the fiscal year ended June 30, 1933, amounted to \$299,902.13. These funds were deposited in the United States Treasury and were expended under the same fiscal regulations that govern in the expenditures of Federal appropriations. The revenues derived from the operation of the national parks and national monuments during the 1933 fiscal year amounted to \$628,182.06. In the 1932 fiscal year, cash donations amounted to \$14,828.50, and revenue receipts were \$820,654.19.

For the fiscal year 1934, \$5,072,790 was appropriated by the Interior Department Appropriation Act approved February 17, 1933, and \$180,000 in the Second Deficiency Act of March 4, 1933. Of these amounts and prior balances, only \$2,743,103.28 was released for actual expenditure, the balance being impounded. However, \$17,059,450 has been authorized for public-works projects by the Public Works Administration for construction of roads and trails, and \$2,145,000 for other physical-improvement projects. The public-works funds are available for the fiscal years 1934 and 1935. In addition, \$1,315,000 is programmed during the 1934 fiscal year for emergency conservation work.

PUBLIC WORKS

The allocation of funds under title II, section 205, of the National Industrial Recovery Act, assures continuation of greatly needed road and trail construction and the various types of other physical improvements which are required in the administration, protection, and maintenance of the national parks and national monuments. Approval of public-works projects, amounting to \$17,059,450 for road and trail work and \$2,145,000 for other physical improvements, will result in construction on an orderly program based upon advance planning and will afford maximum relief to the unemployed. The selection of projects will also provide the greatest possible spread among the far-flung parks and monuments under the jurisdiction of this Service.

For those agencies which were transferred to, and combined with, the former National Park Service under the Executive orders of June 10 and July 28, 1933, the Federal Emergency Administration of Public Works has approved construction of public-works projects amounting to \$1,222,573. Of this amount, \$25,000 is for improvement of the Statue of Liberty, in New York, formerly administered by the War Department, and \$1,197,573 is for projects in the District of Columbia under the former Office of Public Buildings and Public Parks of the National Capital.

CONCLUSION

As this report goes to press the Office of National Parks, Buildings, and Reservations is just finishing its reorganization and entering into a broader field of usefulness even than was possible under the older National Park Service.

It is hoped so to administer the expanded organization that all the functions included in it may continue in accord with the highest traditions of the past; and to eliminate, as experience points out the possibility, all overlapping of functions and waste motion.

In that connection, it is urgently recommended that the name "National Park Service" be given to the enlarged Bureau, instead of that of Office of National Parks, Buildings, and Reservations. Through the efforts of Stephen T. Mather and Horace M. Albright, the National Park Service gained Nation-wide acclaim as an outstanding Government Bureau that lived up to the highest concepts of service and conservation. The reorganization and resultant transfer to it of the military parks and monuments and the National Capital parks makes it more than ever a national park service. On the other hand, the name of "Office of National Parks, Buildings, and Reservations", in addition to its more cumbersome form, does not adequately express the purposes of the Bureau. Not only do many Government buildings remain outside its jurisdiction but it administers comparatively few of our Federal reservations, and those only of park and monument caliber. It is still distinctly a national park service with added responsibilities.

ALL INDIVIDUAL REPORTS OF SPECIAL UNITS ELIMINATED

In the interest of economy none of the customary information on the special field divisions and the individual national parks and monuments is being printed. Data regarding visitors, travel, campers, appropriations, and other statistics on parks and monuments follow:

NATIONAL PARKS TABLE 1.—Holdings acquired for national park and monument purposes

Parks and monuments	Holdings acquired from July 1, 1932, through June 30, 1933					
	Holdings acquired by purchase		Holdings acquired otherwise than by purchase		Total area acquired in acres	Total holdings acquired through June 30, 1933, in acres
	Government funds	Donated funds	Area in acres	How acquired	Area in acres	
1. Acadia National Park.....				Donation.....	452.79	11,859.32
2. Aztec Ruins National Monument.....						25.88
3. Carlsbad Caverns National Park.....	\$7,500.00	\$7,500.00	440.00	Transferred from Navy	440.00	441.00
4. Colonial National Monument.....				Department.	615.27	1,960.52
5. Crater Lake National Park.....	300.00		.25	Exchange.....	.25	.75
6. Craters of the Moon National Monument.....					240.00	240.00
7. General Grant National Park.....						20.00
8. George Washington Birthplace National Monument.....						483.70
9. Glacier National Park.....	7,900.00		160.00	Exchange.....	160.00	3,676.86
10. Grand Canyon National Park.....					19,223.94	19,223.94
11. Great Smoky Mountains National Park.....						297,719.70
12. Hawaii National Park.....						156,800.00
13. Hot Springs National Park.....						16.00
14. Lassen Volcanic National Park.....						40.00
15. Mesa Verde National Park.....						350.20
16. Muir Woods National Monument.....				Exchange.....	426.43	426.43
17. Petrified Forest National Monument.....					3,194.00	3,194.00
18. Pinnacles National Monument.....	19,080.00		240.00		240.00	1,926.27
19. Rocky Mountain National Park.....	3,200.00		162.08		162.08	4,798.93
20. Scotts Bluff National Monument.....						162.08
21. Sequoia National Park.....					3,294.25	3,294.25
22. Wind Cave National Park.....	477.50	477.50	38.20			3,100.77
23. Yellowstone National Park.....	188,300.00	188,300.00	3,084.59		38.20	2,375.88
24. Yosemite National Park.....					3,084.59	27,462.89
25. Zion National Park.....						1,556.36
26. Yucca House National Monument.....						9.00
Totals.....	226,457.50	196,277.50	4,125.12		23,731.00	514,465.31
					27,856.12	542,321.43

TRAVEL, FISCAL, AND MISCELLANEOUS STATISTICS

NATIONAL PARKS TABLE 2.—Visitors to the national parks, 1918-33

Name of park	1918	1919	1920	1921	1922	1923	1924	1925
Acadia.....		¹ 64, 000	¹ 66, 500	¹ 69, 836	73, 779	64, 200	71, 758	73, 673
Crater Lake.....	13, 231	16, 645	20, 135	28, 617	33, 016	52, 017	64, 312	65, 018
General Grant.....	15, 496	21, 574	19, 661	30, 312	50, 456	46, 230	35, 020	40, 517
Glacier.....	9, 086	18, 956	22, 449	19, 736	23, 935	33, 988	33, 372	40, 063
Grand Canyon.....		37, 745	67, 315	67, 485	84, 700	102, 166	108, 256	134, 053
Hawaii.....	(?)	(?)	(?)	¹ 16, 071	27, 750	41, 150	52, 110	64, 155
Hot Springs.....	¹ 140, 000	¹ 160, 490	¹ 162, 850	¹ 130, 968	¹ 106, 164	¹ 112, 000	¹ 164, 175	¹ 265, 500
Lassen Volcanic.....	¹ 2, 000	¹ 2, 500	¹ 2, 000	¹ 10, 000	¹ 10, 000	¹ 9, 500	¹ 12, 500	¹ 12, 956
Mesa Verde.....	2, 058	2, 287	2, 890	3, 003	4, 251	5, 236	7, 109	9, 043
Mount McKinley.....	(?)	(?)	(?)	(?)	³ 7	² 34	² 62	⁴ 206
Mount Rainier.....	43, 901	55, 232	56, 491	55, 771	70, 371	123, 708	161, 473	173, 004
Platt.....	14, 431	26, 312	27, 023	¹ 60, 000	¹ 70, 000	¹ 117, 710	¹ 134, 874	¹ 143, 380
Rocky Mountain.....	101, 497	169, 492	240, 966	¹ 273, 737	⁴ 219, 164	218, 000	224, 211	233, 912
Sequoia.....	15, 001	30, 443	31, 508	28, 263	27, 514	30, 158	34, 468	46, 677
Sullys Hill.....	4, 188	4, 026	9, 341	9, 100	¹ 9, 548	8, 478	8, 035	9, 183
Wind Cave.....	¹ 36, 000	¹ 25, 000	¹ 38, 000	28, 336	31, 016	41, 505	52, 166	69, 267
Yellowstone.....	21, 275	62, 261	79, 777	81, 651	98, 223	138, 352	144, 158	154, 282
Yosemite.....	33, 497	58, 362	68, 906	91, 513	100, 506	130, 046	105, 894	209, 166
Zion.....			3, 692	2, 937	4, 109	6, 408	8, 400	16, 817
Total.....	451, 661	755, 325	919, 504	1, 007, 335	1, 044, 502	1, 280, 886	1, 422, 353	1, 760, 872

Name of park	1926	1927	1928	1929	1930	1931	1932	1933
Acadia.....	101, 256	123, 699	134, 897	149, 554	154, 734	162, 238	237, 596	262, 712
Bryce Canyon.....				21, 997	35, 982	41, 572	34, 143	32, 878
Carlsbad Caverns ⁶					90, 104	81, 275	61, 474	53, 768
Crater Lake.....	86, 019	82, 354	113, 323	128, 435	157, 693	170, 284	109, 738	96, 512
General Grant.....	50, 597	47, 996	51, 988	44, 783	43, 547	51, 995	40, 806	50, 081
Glacier.....	37, 325	41, 745	53, 454	70, 742	73, 776	63, 497	53, 202	76, 715
Grand Canyon.....	140, 252	162, 356	167, 226	184, 093	172, 763	156, 964	121, 267	105, 475
Grand Teton.....				¹ 51, 500	¹ 60, 000	¹ 62, 000	¹ 40, 000	¹ 42, 500
Great Smoky Moun- tains.....						¹ 154, 000	¹ 300, 000	¹ 375, 000
Hawaii.....	¹ 35, 000	37, 551	78, 414	109, 857	89, 578	124, 932	139, 663	237, 690
Hot Springs.....	¹ 260, 000	¹ 181, 523	¹ 199, 099	184, 517	167, 062	153, 394	201, 762	151, 638
Lassen Volcanic.....	18, 739	20, 089	26, 057	26, 106	31, 755	56, 833	41, 723	45, 577
Mesa Verde.....	11, 356	11, 915	16, 760	14, 517	16, 656	18, 003	15, 760	16, 185
Morristown.....								¹ 25, 000
Mount McKinley.....	⁴ 533	⁴ 651	⁴ 802	1, 038	951	771	357	386
Mount Rainier.....	161, 796	200, 051	219, 531	217, 783	265, 620	293, 562	216, 065	170, 104
Platt.....	¹ 124, 284	¹ 294, 954	¹ 280, 638	¹ 204, 598	¹ 178, 188	⁶ 825, 000	200, 471	220, 606
Rocky Mountain.....	¹ 225, 027	¹ 229, 862	¹ 235, 057	¹ 274, 403	255, 874	265, 663	282, 980	291, 934
Sequoia.....	89, 404	100, 684	98, 035	111, 385	129, 221	143, 573	131, 398	126, 464
Sullys Hill.....	19, 921	22, 632	24, 979	21, 004	21, 293	(?)	(?)	
Wind Cave.....	85, 466	81, 023	100, 309	108, 943	88, 000	¹ 85, 000	⁸ 12, 539	10, 460
Yellowstone.....	187, 807	200, 825	230, 984	260, 697	227, 901	221, 248	157, 624	161, 938
Yosemite.....	274, 209	490, 430	460, 619	461, 257	458, 566	461, 855	498, 289	296, 085
Zion.....	21, 964	24, 303	30, 016	33, 383	55, 297	59, 186	51, 650	48, 763
Total.....	1, 930, 955	2, 354, 643	2, 522, 188	2, 680, 597	2, 774, 561	3, 152, 845	2, 948, 507	2, 892, 474

¹ Estimated.² No record.³ Actual park visitors; some miners and prospectors also passed through park.⁴ Indicated loss in travel from 1921 due largely to better methods of checking and estimating employed.⁵ National park established by act of May 14, 1930. Formerly a national monument.⁶ Much of this travel, which is estimated, originated in the locality.⁷ By act of Congress of Mar. 3, 1931, this area was transferred to the Department of Agriculture to be administered as a game preserve.⁸ Actual admissions to the Cave. Through travel over the park highway is estimated at 100,000 cars carrying 300,000 visitors.

NATIONAL PARKS TABLE 3.—*Visitors to the national monuments, 1928-33*¹

Name	1928	1929	1930	1931	1932	1933
Arches (Utah).....		² 500	² 400	² 405	² 480	¹ 425
Aztec Ruins (New Mexico).....	18,359	18,193	12,906	10,710	8,322	7,546
Bandelier (New Mexico).....					4,164	3,906
Canyon de Chelly (Arizona).....				423	395	435
Capulin Mountain (New Mexico).....	² 7,600	² 12,000	² 16,500	² 18,000	² 25,000	¹ 14,000
Carlsbad Cave (New Mexico).....	46,335	76,822	(³)	(³)	(³)	(³)
Casa Grande (Arizona).....	28,274	37,244	36,656	27,675	21,895	21,771
Chaco Canyon (New Mexico).....	1,425	² 2,750	² 2,300	1,780	2,725	5,817
Colonial (Virginia).....					⁴ 400,000	66,418
Colorado (Colorado).....	² 10,000	² 12,000	² 13,000	² 16,000	² 18,000	¹ 20,000
Craters of the Moon (Idaho).....	7,768	7,730	7,365	5,885	6,296	6,068
Devils Tower (Wyoming).....	² 8,000	² 12,000	14,720	² 11,000	11,585	11,009
El Morro (New Mexico).....	5,356	2,625	² 3,500	² 3,854	² 2,700	2,467
George Washington Birthplace (Virginia).....			² 10,000	² 22,500	65,154	44,428
Gran Quivira (New Mexico).....	2,779	3,357	4,812	4,232	3,844	3,563
Great Sand Dunes (Colorado).....					² 500	¹ 550
Hovenweep (Utah-Colorado).....	² 240	² 450	² 400	² 440	² 400	¹ 425
Montezuma Castle (Arizona).....	16,232	17,824	19,298	14,411	² 14,000	13,899
Muir Woods (California).....	103,571	93,358	77,311	73,717	50,746	39,568
Natural Bridges (Utah).....	175	² 260	² 300	² 368	344	654
Navajo (Arizona).....	315	965	215	² 300	² 300	¹ 375
Papago Saguaro (Arizona).....	66,450	² 87,000	² 50,000	(⁵)	(⁵)	(³)
Petrified Forest (Arizona).....	75,225	69,350	105,433	93,898	84,228	224,613
Pinnacles (California).....	13,216	10,756	11,862	12,813	14,238	9,957
Pipe Spring (Arizona).....	17,321	24,883	8,765	² 2,300	² 2,100	2,548
Rainbow Bridge (Utah).....	² 200	² 450	325	² 350	² 325	¹ 385
Scotts Bluff (Nebraska).....	² 37,500	² 42,500	² 48,500	² 48,000	² 45,000	¹ 49,500
Shoshone Cavern (Wyoming).....	² 300					
Sitka (Alaska).....	² 3,000	² 3,500	² 3,000	² 8,000	² 6,500	¹ 1,400
Tumacacori (Arizona).....	17,341	18,250	15,603	12,036	13,758	8,869
Verendrye (North Dakota).....	² 15,000	² 11,500	² 8,000	² 2,000	² 2,000	¹ 5,000
White Sands.....						12,000
Wupatki (Arizona).....	² 500	² 550	684	² 650	² 850	¹ 1,250
Yucca House (Colorado).....	174	² 250	² 240	264	² 240	¹ 300
Total.....	502,656	567,667	472,095	392,011	806,089	589,116

¹ No records for other national monuments.² Estimated.³ Made a national park by act of Congress approved May 14, 1930.⁴ Includes 225,000 attending Sesquicentennial celebration.⁵ National monument status of Papago Saguaro abolished by act of Congress approved Apr. 7, 1930.NATIONAL PARKS TABLE 4.—*Entries of private automobiles to the national parks during seasons 1926-33*¹

Name of park	1926	1927	1928	1929	1930	1931	1932	1933
Acadia ²	15,361	29,181	31,998	35,972	37,118	40,393	58,174	64,953
Bryce Canyon.....				5,223	10,007	11,734	10,469	9,450
Carlsbad Caverns ³					28,850	27,808	19,667	17,181
Crater Lake.....	26,442	25,667	34,869	39,043	51,020	56,189	36,465	28,443
General Grant.....	12,869	13,172	14,681	12,995	13,924	16,245	12,773	15,548
Glacier.....	6,727	7,980	9,860	14,320	18,318	16,415	14,150	20,483
Grand Canyon.....	22,849	28,479	32,316	37,848	39,572	39,844	33,103	27,562
Grand Teton.....				⁴ 16,200	⁴ 20,000	16,170	11,432	¹ 12,000
Great Smoky Mountains ²						⁴ 51,000	⁴ 85,000	¹ 100,000
Hawaii ²	³ 6,500	8,345	14,505	18,347	28,251	31,026	32,204	70,221
Hot Springs ²		⁵ 1,559	⁵ 1,455	28,290	25,426	13,394	33,551	31,015
Lassen Volcanic.....	5,423	5,899	8,137	8,370	9,896	18,273	12,910	13,349
Mesa Verde.....	3,054	3,315	4,803	4,224	5,023	5,334	4,914	4,991
Mount Rainier.....	38,626	48,275	50,005	51,998	62,866	74,947	54,180	42,866
Platt ²	45,796	⁴ 75,000	⁴ 70,000	⁴ 65,000	⁴ 71,500	⁴ 100,000	40,174	40,925
Rocky Mountain ²	³ 50,407	⁴ 54,109	⁴ 57,381	67,682	73,101	75,429	81,359	83,022
Sequoia ⁴	26,503	30,165	29,290	33,250	39,631	44,701	40,820	41,855
Sullys Hill ²	4,484	⁴ 4,700	5,229	4,936	4,284	(⁷)	(⁷)	(⁷)
Wind Cave ²	28,332	26,879	33,300	36,317	⁴ 20,000	⁴ 25,000	⁸ 4,500	3,500
Yellowstone.....	⁵ 44,326	49,055	58,186	68,415	63,588	63,795	46,846	47,042
Yosemite.....	74,885	137,296	131,689	132,903	141,267	151,126	161,909	99,423
Zion.....	4,796	6,203	7,532	8,612	15,633	18,215	16,180	14,980
Total.....	417,380	555,279	595,236	689,945	779,275	897,038	810,780	788,809

¹ Automobiles and motorcycles entering parks with or without licenses, to and including Sept. 30, 1932.² No license required.³ National park established by act of May 14, 1930; formerly a national monument.⁴ Estimated.⁵ Count made only at public camp ground.⁶ License required only for Giant Forest Road.⁷ By act of Congress of Mar. 3, 1931, this area was transferred to the Department of Agriculture to be administered as a game preserve.⁸ Estimated; approximately 100,000 cars went over park highway during 1932 season, but only 4,500 cars (estimated) were used by persons actually entering the cave.

NATIONAL PARKS TABLE 5.—*Automobile and motorcycle licenses issued during seasons 1929-33*

Name of park ¹	1929		1930		1931		1932		1933	
	Auto-mob-iles	Motor-cycles	Auto-mob-iles	Motor-cycles	Auto-mob-iles	Motor-cycles	Auto-mob-iles	Motor-cycles	Auto-mob-iles	Motor-cycles
Crater Lake.....	23,954	46	37,595	10	35,716	51	29,637	-----	19,924	-----
General Grant.....	6,028	-----	7,199	-----	7,397	-----	5,900	-----	6,199	-----
Glacier.....	7,577	-----	10,498	7	11,362	-----	10,712	11	8,955	10
Grand Canyon.....	29,229	-----	33,780	-----	36,797	-----	32,651	-----	30,104	-----
Lassen Volcanic ²	-----	-----	-----	-----	-----	-----	4,803	3	4,924	9
Mesa Verde.....	3,926	9	4,599	-----	4,863	-----	4,382	-----	4,262	-----
Mount Rainier.....	32,184	61	35,498	28	41,217	16	44,719	-----	31,903	-----
Sequoia ³	16,799	-----	20,998	-----	21,802	-----	18,304	-----	17,045	-----
Yellowstone.....	56,150	159	63,853	187	56,401	176	52,597	155	38,580	46
Yosemite.....	74,229	167	81,365	186	76,678	175	67,482	129	61,742	118
Zion.....	6,822	-----	10,284	-----	15,754	-----	12,967	-----	12,194	-----
Total.....	256,898	442	305,669	418	307,987	418	284,154	298	235,832	183

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.

² No license required prior to 1932 fiscal year.

³ License required only for Giant Forest Road.

Licenses not required in certain parks because of small road mileage or unimproved condition of roads (see footnote 1). Licenses also not required for travel on unimproved roads in other parks. No charge for license issued for operating cars on official business.

NATIONAL PARKS TABLE 6.—*Receipts collected from automobiles and motorcycles during seasons 1929-33*

Name of park ¹	1929	1930	1931	1932	1933
Crater Lake.....	\$24,000.00	\$37,623.00	\$35,803.00	\$29,687.00	\$19,924.00
General Grant.....	3,014.00	3,599.50	3,698.50	2,950.00	3,099.50
Glacier.....	7,577.00	10,506.00	11,362.00	11,092.00	8,965.00
Grand Canyon.....	29,300.00	33,988.00	36,950.00	32,764.00	30,104.00
Lassen Volcanic ²	-----	-----	-----	5,778.50	4,928.50
Mesa Verde.....	3,944.00	4,644.00	4,917.00	4,396.00	4,262.00
Mount Rainier.....	32,245.00	35,526.00	41,233.00	44,719.00	31,903.00
Sequoia ³	16,799.00	20,998.00	21,802.00	18,304.00	17,045.00
Yellowstone.....	168,608.00	192,218.00	169,379.00	156,537.00	115,786.00
Yosemite.....	148,613.00	162,784.00	153,531.00	135,831.00	123,602.00
Zion.....	3,431.50	7,521.00	15,400.00	12,976.00	12,194.00
Total.....	437,531.50	509,407.50	494,075.50	455,034.50	371,813.00

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.

² No license required prior to 1932 fiscal year.

³ License required only for Giant Forest Road.

NATIONAL PARKS TABLE 7.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years ¹*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Acadia (formerly Lafayette):			
1928.....	\$37,940.00	\$37,376.99	-----
1929.....	39,000.00		-----
1929 (deficiency).....	1,355.00	40,014.00	-----
1930.....	52,600.00	48,701.52	-----
1931.....	59,900.00	56,984.42	-----
1932.....	61,600.00	² 59,892.14	-----
1933.....	59,400.00	57,602.08	10.00
1934.....	55,000.00	-----	-----
Bryce Canyon:			
1930.....	26,100.00	21,580.01	-----
1931.....	13,700.00	13,700.00	-----
1932.....	20,000.00	² 19,257.50	-----
1933.....	14,800.00	12,455.43	-----
1934.....	13,790.00	-----	-----

See footnotes at end of table.

NATIONAL PARKS TABLE 7.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Carlsbad Caverns National Park:			
1928.....	\$30,000.00	\$28,492.84	\$55,682.00
1929.....	70,000.00	63,490.00	84,983.45
1929 (deficiency).....	260.00		
1930.....	100,000.00	¹ 103,271.01	136,241.78
1931.....	165,600.00	124,220.75	143,779.55
1932.....	150,100.00	² 130,162.62	113,677.43
1933.....	128,500.00	⁴ 135,687.63	77,236.57
1934.....	63,330.00		
Crater Lake:			
1928.....	63,590.00	62,382.53	22,927.69
1929.....	47,100.00	³ 61,464.00	24,318.22
1929 (deficiency).....	850.00		
1930.....	59,800.00	67,938.75	38,023.70
1930 (deficiency).....	12,000.00		
1931.....	³ 73,300.00	73,551.96	35,843.15
1932.....	106,900.00	106,753.64	29,687.00
1933.....	90,000.00	86,554.37	19,924.00
1934.....	63,479.00		
General Grant:			
1928.....	13,650.00	13,529.26	3,488.90
1929.....	15,650.00	15,802.00	3,305.70
1929 (deficiency).....	500.00		
1930.....	15,650.00	15,448.14	3,868.28
1931.....	15,860.00	15,841.07	3,989.95
1932.....	21,900.00	21,881.86	3,973.22
1933.....	21,900.00	20,913.85	3,437.16
1934.....	15,000.00		
Glacier:			
1928.....	163,300.00	162,525.28	14,652.59
1929.....	188,200.00	191,061.00	18,436.18
1929 (deficiency).....	5,065.00		
1930.....	219,400.00	215,726.91	22,146.16
1931.....	227,000.00	223,950.32	17,866.46
1931 (deficiency).....	9,550.00		
1932.....	256,500.00	² 246,002.11	17,495.56
1933.....	226,200.00	224,744.51	12,006.64
1934.....	201,803.00		
Great Smoky Mountains:			
1930-31 (deficiency).....	30,000.00	25,193.31	76.00
1932.....	30,000.00	² 29,682.77	5,220.55
1933.....	30,000.00	27,959.52	5,140.69
1934.....	28,430.00		
Grand Canyon:			
1928.....	128,760.00	128,268.33	46,097.43
1929.....	169,000.00	151,813.00	49,078.33
1929 (deficiency).....	3,540.00		
1930.....	145,000.00	141,389.56	55,684.46
1931.....	153,600.00	³ 171,670.11	51,497.05
1932.....	172,200.00	² 168,106.43	40,221.18
1933.....	150,000.00	142,656.15	32,933.93
1934.....	135,890.00		
Grand Teton:			
1929.....			25.00
1930.....			70.00
1931.....	30,700.00	29,048.47	20.00
1932.....	76,750.00	² 73,180.80	73.80
1933.....	29,900.00	26,243.06	45.00
1934.....	20,000.00		
Hawaii:			
1928.....	18,250.00	18,119.10	1,450.00
1929.....	21,500.00	21,070.00	1,477.00
1929 (deficiency).....	785.00		
1930.....	27,400.00	25,700.05	1,532.52
1931.....	35,800.00	35,439.55	1,500.00
1932.....	54,600.00	54,594.06	1,493.41
1933.....	51,100.00	50,095.20	482.46
1934.....	48,079.00		
Hot Springs:			
1928.....	69,800.00	67,433.19	47,695.50
1929.....	68,000.00	71,970.00	47,930.90
1929 (deficiency).....	6,320.00		
1930.....	70,900.00	69,173.38	47,931.33
1931.....	218,500.00	194,760.18	50,467.80
1932.....	89,300.00	² 86,110.72	43,243.22
1933.....	87,700.00	82,359.03	38,263.90
1934.....	82,680.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 7.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Lassen Volcanic:			
1928.....	\$15,625.00	\$15,448.52	\$167.84
1929.....	22,400.00		
1929 (deficiency).....	460.00	22,688.00	34.36
1930.....	25,300.00	25,061.16	3,089.55
1931.....	30,500.00	29,007.20	51.59
1932.....	50,300.00	² 49,774.20	5,778.50
1933.....	45,100.00	43,310.99	4,980.96
1934.....	28,334.00		
Mesa Verde:			
1928.....	50,750.00	48,343.59	3,342.80
1929.....	83,000.00		
1929 (deficiency).....	1,115.00	³ 78,134.00	4,719.00
1930.....	57,000.00	53,910.66	4,870.62
1931.....	96,800.00	⁴ 95,799.70	5,411.27
1932.....	57,300.00	² 55,724.49	5,011.75
1932 (deficiency).....	22,000.00		
1933.....	72,900.00	⁴ 91,693.26	4,750.50
1934.....	52,509.00		
Mount Rainier:			
1928.....	108,000.00	105,447.74	32,495.50
1929.....	141,000.00		
1929 (deficiency).....	3,370.00	³ 141,285.00	39,233.17
1929-30 (deficiency).....	2,500.00		
1930.....	122,600.00	125,214.00	41,530.31
1931.....	180,900.00	174,823.33	46,034.89
1932.....	195,000.00	² 263,233.48	48,793.27
1931-32 (deficiency).....	71,000.00		
1933.....	227,100.00	214,501.02	33,506.96
1934.....	143,884.00		
Mount McKinley:			
1928.....	22,000.00	21,314.12	63.04
1929.....	35,900.00		
1929 (deficiency).....	740.00	³ 36,165.00	1.00
1930.....	40,000.00	37,680.26	213.18
1931.....	46,700.00	42,686.45	292.00
1932.....	31,100.00	28,157.21	129.66
1933.....	35,600.00	32,165.49	25.00
1934.....	28,480.00		
Platt:			
1928.....	13,050.00	12,991.87	77.16
1929.....	18,000.00		
1929 (deficiency).....	1,080.00	19,053.00	33.05
1930.....	16,200.00	16,178.70	
1931.....	18,500.00	18,269.14	
1932.....	35,900.00	² 35,506.83	
1933.....	31,600.00	30,333.10	
1934.....	28,520.00		
Rocky Mountain:			
1928.....	97,620.00	95,612.07	924.12
1929.....	95,500.00		
1929 (deficiency).....	2,380.00	³ 95,230.00	1,537.07
1930.....	96,000.00	94,871.34	4,471.24
1931.....	105,950.00	104,880.57	448.45
1932.....	118,800.00	² 117,909.55	749.58
1933.....	114,300.00	111,361.48	1,046.41
1934.....	98,007.00		
Sequoia:			
1928.....	109,000.00	108,863.10	35,105.83
1929.....	113,000.00		
1929 (deficiency).....	3,440.00	³ 114,626.00	30,753.00
1930.....	130,000.00	130,056.49	33,934.54
1931.....	113,100.00	111,513.95	35,694.49
1932.....	156,900.00	156,713.93	33,010.38
1933.....	131,800.00	129,146.15	30,189.77
1934.....	113,317.00		
Shenandoah (proposed):			
1934.....	⁶ 80,000.00		
Wind Cave:			
1928.....	10,850.00	11,500.00	12,725.50
1929.....	11,000.00		
1929 (deficiency).....	760.00	11,744.00	13,178.17
1930.....	13,500.00	13,442.51	16,715.01
1931.....	54,900.00	46,271.94	11,968.43
1932.....	25,200.00		
1931-32 (deficiency).....	50,000.00	² 68,074.68	7,258.68
1933.....	20,600.00	20,345.64	5,056.19
1934.....	18,160.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 7.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Yellowstone:			
1928.....	\$400,000.00	³ \$399,150.00	\$251,663.11
1929.....	434,000.00	³ 443,230.00	289,388.95
1929 (deficiency).....	12,230.00		
1930.....	453,000.00	463,306.47	317,238.17
1930 (deficiency).....	17,000.00		
1931.....	501,275.00	500,026.39	259,723.33
1932.....	560,800.00	² 536,739.83	228,644.39
1933.....	530,800.00	497,681.85	149,853.87
1934.....	466,309.00		
Yosemite:			
1928.....	301,000.00	⁴ 257,363.73	276,438.20
1928 (deficiency).....	15,000.00		
1929.....	387,250.00	³ 449,159.00	237,166.90
1929 (deficiency).....	14,385.00		
1930.....	412,300.00	⁴ 390,204.38	280,355.45
1930 (deficiency).....	5,381.00		
1931.....	510,100.00	574,302.64	260,805.28
1931 (deficiency).....	32,500.00		
1932.....	558,600.00	² 535,376.25	222,629.17
1933.....	401,200.00	389,523.19	196,319.94
1934.....	335,309.00		
Zion:			
1928.....	30,900.00	30,737.69	3,106.50
1929.....	38,000.00	40,569.00	3,576.50
1929 (deficiency).....	3,295.00		
1930.....	38,300.00	³ 42,290.11	7,724.01
1931.....	33,200.00	³ 32,589.60	15,500.50
1932.....	54,100.00	² 53,145.65	13,067.30
1933.....	46,600.00	45,451.53	12,194.00
1934.....	47,440.00		
George Washington B.P. National Monument:			
1930 (deficiency).....	996.18	987.71	
1930-31 (deficiency).....	80,000.00	78,782.34	
1931.....	2,500.00		
1932.....	26,500.00	² 26,050.83	1.00
1933.....	25,800.00	22,661.61	20.00
1934.....	21,250.00		
Colonial National Monument:			
1931-32 (deficiency).....	135,000.00	² 132,648.99	299.95
1933.....	72,000.00	53,615.41	504.92
1934.....	52,030.00		
Protection of National Monuments:			
1928.....	25,000.00	24,042.56	132.00
1929.....	35,000.00	35,951.00	97.00
1929 (deficiency).....	1,225.00		
1930.....	46,000.00	⁴ 42,634.76	100.00
1931.....	83,900.00	71,598.75	269.60
1931 (deficiency).....	3,000.00		
1932.....	165,400.00	⁴ 147,585.89	195.19
1933.....	93,800.00	⁴ 86,978.64	252.05
1934.....	89,060.00		
National Park Service:			
1928.....	57,100.00	57,047.56	20.10
1929.....	70,200.00	³ 75,714.00	
1929 (deficiency).....	4,660.00		
1930.....	80,830.00	81,864.36	.25
1931.....	117,000.00	115,859.20	
1932.....	167,400.00	165,299.20	
1933.....	174,620.00	174,547.94	1.14
1934.....	160,000.00		
Fighting forest fires:			
1922.....	25,000.00	9,618.30	
1923.....	25,000.00	17,764.16	
1924.....	25,000.00	6,526.02	
1925.....	20,000.00	20,000.00	
General expenses, National Park Service:			
1931.....	25,000.00	24,993.02	
1932.....	35,100.00	31,904.58	
1933.....	37,000.00	33,914.87	
1934.....	25,000.00		
Emergency reconstruction: 1925.....	20,000.00	17,009.15	

See footnotes at end of table.

NATIONAL PARKS TABLE 7.—*Statements of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Forest protection and fire prevention:			
1931	\$96,850.00	\$95,856.95	
1932	170,000.00	³ 167,247.75	
1933	140,000.00	132,491.82	
1934	147,000.00		
Emergency reconstruction and fighting forest fires:			
1926	40,000.00	80,000.00	
1926 (deficiency)	40,000.00		
1927	40,000.00	40,000.00	
1927 (deficiency)	235,000.00	228,647.83	
1928	40,000.00	26,865.46	
1929 (deficiency)	29,000.00	⁴ 40,138.26	
1930	20,000.00	180,300.17	
1930 (deficiency)	180,000.00		
1931	50,000.00	40,481.49	
1932	50,000.00	⁴ 169,950.35	
1932 (deficiency)	55,000.00		
1933	50,000.00	⁴ 57,228.83	
1934	150,000.00		
Construction of roads and trails:			
1925 (deficiency)	1,000,000.00	1,000,000.00	
1926	1,500,000.00	1,500,000.00	
1927	2,000,000.00	2,000,000.00	
1928	2,000,000.00	2,000,000.00	
1928 (deficiency)	1,000,000.00	1,000,000.00	
1929	2,500,000.00	2,500,000.00	
1930	5,000,000.00	5,000,000.00	
1931	5,000,000.00	7,500,000.00	
1931 (deficiency)	2,500,000.00		
1932	5,000,000.00	5,000,000.00	
1933	4,500,000.00	4,500,000.00	
1934	2,435,700.00		
Emergency construction, roads and trails:			
1931 (deficiency)	2,078,800.00	2,078,800.00	
1933	3,000,000.00	3,000,000.00	
Insect control:			
1925-26 (deficiency)	25,000.00	24,945.24	
1927	20,000.00	19,828.96	
1928	7,500.00	7,379.35	
Southern Appalachian:			
1925-26 (deficiency)	20,000.00	12,453.27	
1927	(¹)	7,252.21	
1928	5,000.00	⁴ 3,887.13	
1929	4,500.00	⁴ 3,945.07	
1930	3,000.00	⁴ 3,415.75	
1931	3,000.00	⁴ 4,172.45	
Purchase of lands:			
1928	50,000.00	13,925.00	
1929	50,000.00	1,383.00	
1930	250,000.00	17,233.93	
1931	1,750,000.00	⁵ 1,983,718.06	
1932	1,000,000.00	⁴ 711,688.33	
1933		⁵ 238,396.19	
Extension of winter-feed facilities:			
1930	75,000.00	7,612.50	
1931	75,000.00	10,265.00	
1932		⁵ 12,022.50	
1933		⁵ 477.50	
Purchase of lands Colonial National Monument:			
1931-32 (deficiency)	500,000.00	500,000.00	
Public works projects, roads and trails:			
1933-35	17,059,450.00		
Public works projects, physical improvements:			
1933-35	2,145,000.00		
Emergency conservation work:			
1933-34 (allotments program)	3,271,000.00		

¹ For statement of appropriations and revenues prior to 1917 see 1920 Annual Report, pp. 354-358, and for 1918-27 see 1930 Annual Report, pp. 66-72.² Appropriation decreased by transfers to emergency reconstruction and fighting forest fires under authority contained in the appropriation act. (See table 18.)³ Appropriation augmented by transfers from other appropriations under 10 percent clause.⁴ Reappropriated items. (See table 14.)⁵ Available until expended.⁶ Not available until park is established.

NATIONAL PARKS TABLE 8.—*Statement of accounts reappropriated and made available for expenditure in subsequent fiscal years*

Appropriated for fiscal year	Reappropriated for fiscal year	Park	Amount	Purpose
1928.....	1929	Yosemite.....	\$35,000.00	Hospital building.
1928.....	1929	Southern Appalachian.....	1,112.87	To remain available; general.
1928.....	1929	Emergency reconstruction and fighting forest fires.	13,134.54	Do.
1929.....	1930	Yosemite.....	8,661.78	Construction of water-supply and camp-ground facilities.
1929.....	1930	Calrsbad Caverns.....	4,950.00	Superintendent's residence.
1929.....	1930	Southern Appalachian.....	1,662.55	To remain available; general.
1929.....	1931	Grand Canyon.....	20,000.00	Hospital building.
1930.....	1931	Acadia.....	2,850.00	Equipment storage building.
1930.....	1931	Crater Lake.....	1,091.06	Ranger station.
1930.....	1931	Mesa Verde.....	1,652.18	2 ranger stations.
1930.....	1931	Yosemite.....	32,662.70	Physical improvements.
1930.....	1931	National monuments.....	2,500.00	Employees' quarters (2) at Petrified Forest.
1930.....	1931	Southern Apalachian.....	1,246.80	To remain available; general.
1930.....	1931	Glacier.....	9,550.00	One third of cost of constructing a telephone line.
1931.....	1932	National monuments.....	1,759.23	Water-supply system at Craters of the Moon.
1931.....	1932	Emergency reconstruction and fighting forest fires.	7,434.15	To remain available; general.
1931.....	1933	National monuments.....	3,204.50	Water supply at Chaco Canyon.
1932.....	1933	Calrsbad Caverns.....	13,000.00	Electric system, extension and improvement.
1932.....	1933	Emergency reconstruction and fighting forest fires.	16,587.00	To remain available; general.

NATIONAL PARKS TABLE 9.—*Summary of appropriations for the administration, protection, and improvement of the national parks and national monuments, together with the revenues received, for the fiscal years 1917¹–33, inclusive*

Year	Department	Appropriation	Revenues
1917	Interior Department.....	\$537,366.67	
	War Department.....	247,200.00	
		\$784,566.67	\$180,652.30
1918	Interior Department.....	530,680.00	
	War Department.....	217,500.00	
		748,180.00	² 217,330.55
1919	Interior Department.....	963,105.00	
	War Department.....	50,000.00	
		50,000.00	
1920		1,013,105.00	196,678.03
1921		907,070.76	316,877.96
1922		1,058,969.16	396,928.27
1923		1,433,220.00	432,964.89
1924		1,446,520.00	513,706.36
1925		1,892,601.00	663,886.32
1926		3,027,657.00	670,920.98
1927		3,258,409.00	826,454.17
1928		3,698,920.00	703,849.60
1929		4,889,685.00	808,255.81
1930		4,754,015.00	849,272.95
1931		7,813,817.18	1,015,740.56
1932		12,113,435.00	940,364.79
1933		12,831,250.00	820,654.19
1934		10,640,620.00	628,182.06
		27,728,240.00	-----

¹ For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.² The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 10.—*Statement of appropriations and authorizations for road and trail work in the national parks and national monuments*

Appropriation acts	Fiscal year	Cash appropriation	Authority to enter into contractual obligations	Total program by fiscal year
Act Dec. 5, 1924; 43 Stat. 686.....	1925	¹ \$1, 000, 000	-----	\$1, 000, 000
Act Mar. 3, 1925; 43 Stat. 1179.....	1926	1, 500, 000	² \$1, 000, 000	2, 500, 000
Act May 10, 1926; 44 Stat. 491.....	1927	2, 000, 000	² 1, 500, 000	2, 500, 000
Act Jan. 12, 1927; 44 Stat. 966.....	1928	2, 000, 000	² 2, 500, 000	-----
First Deficiency act, Dec. 22, 1927; 45 Stat. 19.....		1, 000, 000		3, 000, 000
Act Mar. 7, 1928; 45 Stat. 237.....	1929	2, 500, 000	² 4, 000, 000	5, 000, 000
Act Mar. 4, 1929; 45 Stat. 1601.....	1930		² 2, 500, 000	3, 500, 000
Act May 14, 1930; 46 Stat. 319.....		5, 500, 000		-----
Act Dec. 20, 1930; emergency construction.....	1931	1, 500, 000	² 2, 500, 000	-----
Emergency construction funds transferred by the President.....		578, 800		7, 078, 800
Act Feb. 14, 1931; 46 Stat. 1115.....	1932	5, 000, 000	² 2, 850, 000	-----
Second Deficiency act 1931; Mar. 4, 1931.....		2, 500, 000		7, 850, 000
Act Apr. 22, 1932 47 Stat. 126, 127.....	1933	4, 500, 000	² 2, 500, 000	7, 150, 000
Emergency construction and relief.....		3, 000, 000		-----
Act Feb. 17, 1933; 47 Stat. 852, 853.....	1934	2, 435, 700		64, 300
Total appropriated.....		\$39, 514, 500		-----
Total program to date.....				\$39, 514, 500

¹ Of this amount \$4,290.39 was reappropriated Dec. 22, 1927 (45 Stat. 46), and \$510 on May 29, 1928 (45 Stat. 933).

² Funds appropriated in next year.

³ \$64,300 of this amount was not appropriated in 1934.

GEOLOGICAL SURVEY

(WALTER CURRAN MENDENHALL, Director)

The appropriations made directly for the work of the Geological Survey for the fiscal year 1933 included 12 items, amounting to \$2,181,000. Of the balance remaining in the 1932 appropriation for topographic surveys, \$150,000 was continued available for expenditure during the fiscal year 1933, and the sum of \$284,400 was transferred to the Geological Survey under the provisions of section 317 of the legislative appropriation act of June 30, 1932, making a total of \$2,615,400 available for expenditure. In addition, \$12,424.50 for miscellaneous supplies was allotted from appropriations for the Interior Department.

A detailed statement of the amounts appropriated and expended is given at the end of the report. The balance on July 31 was \$192,265.07.

The total amount of funds made available for disbursement by the Geological Survey, together with State funds directly disbursed for work administered by the Federal officials, was \$4,032,552.62.

THE YEAR'S OPERATIONS

Geological work.—The geologic work done during the year included economic and general studies of metal-mining districts in Colorado, Idaho, Nevada, New Mexico, Utah, and Virginia; of coal fields in Montana, Utah, and New Mexico; of oil and gas fields in Kansas, California, Montana, Colorado, and Utah; and of phosphate, oil shale, and other mineral deposits in Wyoming. In much of this work State surveys and other organizations cooperated. One of the most notable achievements of the year was the completion and publication of the new geologic map of the United States on the scale of 1 : 2,500,000. Potash investigations were continued as part of the regular work, no special funds being available. Cuttings from oil wells and samples from private core tests on Government permit areas were studied mineralogically and petrographically, and the analyses and other tests for potash numbered 2,445. This work disclosed a third source of commercial sylvite in New Mexico. Areal mapping or other general geologic work was done in 30 States and volcanologic work in Hawaii.

Explorations in Alaska.—In the season of 1932 eight field projects in Alaska resulted in the geologic mapping of 2,730 square miles and the topographic mapping of 3,571 square miles. On one of these projects the Alaska Railroad cooperated. Of the total area of Alaska 44.8 percent has now been covered by geologic surveys and 47.8 percent by topographic surveys. The usual general survey of recent mining developments, collection of mineral statistics, and supervision of operations under coal and oil leases on Government lands were continued. Three field projects for the season of 1933 had been started at the end of the

fiscal year. The work done in cooperation with the Alaska Railroad included, in addition to the survey project already mentioned, core drilling to test two coal areas in the railroad belt. This work indicated that the areas do not warrant development under present conditions. In the office a little more than 1,000 square miles of new drainage base was compiled from aerial photographs taken by the Navy Department in 1926 and 1929.

Topographic mapping.—The area mapped topographically during the year amounted to 20,191 square miles and the total area now mapped, exclusive of Alaska, is 1,387,207 square miles. Ten States, the District of Columbia, and Hawaii are completely mapped, and the percentages in the other States range from 8 in Florida to 88.9 in Virginia. Of the continental United States, exclusive of Alaska, 45.6 percent has been mapped. Cooperative funds furnished by States for topographic mapping during the year amounted to \$370,309.71 and came from 16 States and 2 counties. Cooperation was also rendered by the War Department and the Department of Justice. The office work included the completion of stereophotogrammetric mapping from aerial photographs of Bryce Canyon National Park, the mounting of 4,000 multiple-lens photographs for the Guatemala-Honduras Boundary Tribunal, corrections to State maps for use in assembling a map of the Tennessee River Basin, and other routine or special projects.

Investigation of water resources.—The work on water resources is done largely in cooperation with other Government organizations, with State, county, and municipal agencies, and with permittees and licensees of the Federal Power Commission. The amount expended by State, county, and municipal agencies for such work during the year, in part directly and in part through the Geological Survey, was \$524,988.53. Including the cooperative work, the study of surface waters, which consists primarily of the measurement of the flow of streams, was carried on in 48 States, the District of Columbia, and Hawaii, in which at the end of the year 2,801 gaging stations were being maintained. In this work 40 of the States and Hawaii cooperated. Investigations relating to ground water or power and reservoir sites were made in 19 States and Hawaii. The number of water-stage recorders in operation over observation wells has now reached 125. In the hydrologic laboratory 496 samples of water-bearing material were analyzed. The work on quality of water involved the examination of 1,034 samples of water. Studies of the dissolved and suspended matter in the Colorado River and its tributaries were continued. The investigations of power resources included the preparation of monthly and annual reports on the production of electricity and consumption of fuel by public-utility power plants, a report on the developed waterpower of the United States, and compilations of the stocks of coal held by electric public-utility power plants. The studies of water utilization and flood control included investigations relating to the apportionment of water on international streams and studies of the effect of a dam in Canada on the behavior of surface and ground water in the United States. Special field work was done in connection with 120 projects of the Federal Power Commission.

Classifying and leasing public lands.—The classification of public lands with respect to their mineral, waterpower, and agricultural value, and the technical supervision of mineral and power development on such lands and of mineral development on Indian lands, were continued in 21 States and Alaska. The number of cases involving land classification, acted on during the year was 12,568, and the results accomplished include net decreases of 597,479 acres in outstanding withdrawals for coal and of 356 acres in outstanding withdrawals for oil and a net increase of 191,851 acres in areas classified as coal land. At the end of the year the total area classified as mineral in character amounted to 37,081,414 acres in 14 States and Alaska, and the outstanding mineral with-

drawals to 50,918,765 acres in 14 States. Definition of the "known geologic structure" of producing oil and gas fields was continued, and at the end of the year the net area so defined was 944,951 acres in 7 States. Investigations to obtain information for classifying public land with respect to its value for the development of waterpower were made in 2 States. There was a net increase of 105,625 acres in the area included in power reserves, making a total of 6,682,810 acres in 21 States and Alaska, on which about 15,000,000 continuous horsepower can be developed. The net decrease in enlarged-homestead designations was 4,850,782 acres, making a total outstanding of 309,498,084 acres in 14 States, and the net increase in stock-raising homestead designations was 705,440 acres, making a total outstanding of 124,302,026 acres in 19 States. There was a net increase of 39,365 acres in public water reserves, and the total outstanding is now 487,201 acres in 12 States and Alaska.

The supervisory work on public lands subject to the mineral leasing laws was increased by the issuance of 71 leases, 32 licenses, and 1,180 permits, and decreased by 646 cancelations and expirations of leases, permits, and licenses. The production of petroleum on such lands during the year was 24,662,589.46 barrels, of natural gas 56,637,196,000 cubic feet, and of gasoline 91,549,635.62 gallons, on which the royalty, rentals, and bonuses amounted to \$3,292,712.38. The production of coal on such lands was 2,947,384 tons, of phosphate rock 1,643.04 tons, of potash 173,563.16 tons, and of sodium salts 37,314 tons, on which the royalty, rentals, and bonuses amounted to \$356,264. Supervision over oil and gas operations on naval petroleum reserves was continued, and the total production was 3,672,408.11 barrels of petroleum, 3,917,098,000 cubic feet of natural gas, and 15,876,707 gallons of gasoline, on which the royalty value was \$706,107.47. Inspectional, regulatory, and advisory service was rendered in connection with the leasing of mineral deposits on Indian lands in eight States.

Publications.—The publications of the year consisted of 53 books and pamphlets of the regular series, 29 guidebooks for the excursions of the International Geological Congress, 99 new or revised maps, 149 reprinted maps, 1 geologic folio, and numerous circulars, lists of publications, etc. The total number of pages in the new book publications, including the guidebooks, was 10,572. In addition to these publications, 48 brief papers, several of them accompanied by maps, were issued in mimeographed form as memoranda for the press. The publications distributed numbered 712,904, of which 3,776 folios and 477,867 maps were sold for \$29,969.21.

GEOLOGICAL BRANCH

Geologic work in the usual classes of economic surveys and investigations and general or special research problems was actively carried on throughout the year, but the amount of field work done was considerably less than in recent years. Rigid economy was necessary because the total available funds for the work of the geologic branch for the year were about \$100,000 less than for the fiscal year 1932. Many geologists who ordinarily spend 3 to 5 months of each year in field work remained in the office and prepared reports on projects that had previously been investigated in the field.

The preliminary uncolored edition of the geologic map of Texas was printed early in the year and was distributed to geologists and oil companies of the region for criticism and correction. The compilation of the resultant new data for the map in its final colored form is nearing completion, but lack of funds for engraving and printing may

postpone publication for some time. The publication in June of a new geologic map of the United States on the scale of 1:2,500,000 is one of the most notable achievements of the year. An important continuous service to the public is rendered in the geologic branch by the identification of rocks, ores, minerals, and fossils and by carefully prepared letters in answer to numerous daily inquiries on geologic topics.

WORK OF THE YEAR, BY STATES

Alabama.—Studies of the brown iron ores of the Russellville district and of the iron ore in the Red Mountain formation in northeastern Alabama, cooperative projects with the Geological Survey of Alabama, were continued. A report on Iron Ore in the Red Mountain Formation in Greasy Cove was issued as circular 1.

Arizona.—The guidebook of the Southern Pacific lines, New Orleans to Los Angeles, was completed for publication as Bulletin 845. Geologic investigations included field mapping of the Tucson quadrangle, brief examination of manganese deposits near Artillery Peak, study of the geology and ore deposits of the Ajo copper district, and examination of a dam site in the San Carlos project for the Office of Indian Affairs.

Arkansas.—Field work in the Ouachita Mountains of Oklahoma and Arkansas was continued. A preliminary report on the cooperative study of the zinc and lead deposits of northern Arkansas was issued during the year, and work on a paper on recent developments in the Batesville manganese district was completed. Stratigraphic and paleontologic studies included the Morrow formation and the Batesville sandstone, echinoderm microfaunas from the Mississippian, microfossils from the Carboniferous, and Wedington flora of the Fayetteville shale and of the Jackfork sandstone and Stanley shale.

California.—The study of the Kettleman Hills oil and gas field was continued. Field work in the San Pedro Hills was begun, and field work on the siliceous sediments and associated rocks of the Monterey group was completed. Studies of source rocks of petroleum in several oil fields of southern California were continued. Office work was also continued on the reports on the Ivanpah quadrangle, on the Grass Valley district, and chromite deposits in northern California. Studies were continued on the San Andreas rift and the southern part of Death Valley. Work was prosecuted in connection with the report on the geomorphology of the upper San Joaquin Basin.

Colorado.—Study of the mining regions of the State was continued in cooperation with the Geological Survey Board of Colorado and the Colorado Metal Mining Fund, though the work was curtailed owing to decrease of funds. A general report on the geology and ore deposits of the State is in preparation to accompany the geologic map, which is now almost ready for engraving. An intensive field study was made of the Arrastre Basin of the San Juan region, and the report was sent to the Colorado Scientific Society for publication. Field work was carried on in the Jamestown district, in the Snowmass area and in the Nederland tungsten area. A study of the Independence Pass district was made with special reference to the driving of tunnels for diversion of water from the west to the east slope of the Continental Divide.

The geologic mapping of the Tertiary and Upper Cretaceous formations of eastern Colorado, north of the Arkansas River and south of the Platte River, was completed and progress was made on a detailed report.

Florida.—Studies were continued of pelecypods and gastropods from the Alum Bluff group (Miocene) including work on the preparation of the report on the Tampa limestone (Miocene), in cooperation with the Florida Geological Survey.

Hawaii.—The work of the section of volcanology at Volcano House, Hawaii National Park, was carried on during the year and included observing volcanoes, operating local seismographs, doing oceanographic work, especially on tidal waves, measuring horizontal and vertical movements of the ground by surveying methods, building and improving instruments of research for volcano and earthquake study, carrying on special researches for publication suggested by the back records, etc. At Lassen, Calif., other systematic measurements include hot-spring temperatures and land slipping. The Hawaiian Volcano Research Association has assisted the Geological Survey in the past and carried all the expenses of the Hawaiian station except salaries of the professional staff in 1933.

Idaho.—Studies of some mining districts in Idaho were continued in cooperation with the Idaho Bureau of Mines and Geology. Field work was done in the Buffalo Hump, Elk City, and adjoining districts, and several reports were prepared. Work in the Boise Basin in the Yellow Pine, Edwardsburg, and Thunder Mountain districts was prosecuted. A report on some lode deposits in the northwestern part of the Boise Basin is ready for publication.

Illinois.—Work on the Pottsville fossil floras of the eastern interior coal basin of Illinois, including small areas in adjoining States, which is being carried on in cooperation with the Illinois Geological Survey, was well advanced.

Indiana.—The Survey continued its work on new crinoid genera from the Mississippian, Devonian, and Silurian.

Iowa.—Studies of the typical Kinderhook fauna were continued.

Kansas.—A report on the origin of the shoestring oil sands of Greenwood and Butler Counties and adjacent areas was completed. This is a cooperative project between the State and Federal surveys.

Kentucky.—A report on fossil flora of the New Providence shale with notes on a new representative of the Calamopityeae from Junction City is in preparation.

Louisiana.—Studies of the cap rock of salt domes of southern Louisiana were continued. The Southern Pacific Guidebook is noted under Arizona.

Maine.—The Geological Survey cooperated with the State geologist of Maine in the preparation of a State geologic map, which will be issued by the State.

Maryland.—Work on the geology of the Appalachian Mountain region of Maryland, in cooperation with the Maryland Geological Survey, was continued.

Massachusetts.—A field and office review of the stratigraphy and structure of the Taconic quadrangle were made in connection with general geologic studies in the region.

Michigan.—The preparation of material for a revised report on the Lake Superior iron-ore region was continued.

Minnesota.—See Michigan: Lake Superior iron-ore region.

Mississippi.—A report on the geology of the Jackson, Florence, and Pelahatchee quadrangles is in preparation. A study of Cretaceous volcanism and structural history of the Jackson gas field was inaugurated.

Missouri.—Informal cooperation with the Missouri Bureau of Geology and Mines in the identification of fossils was carried on. Paleontologic studies were continued on some early Paleozoic fossils, on echinoderm microfauna from the Mississippian formation, on the Kinderhook fauna, on the Warsaw fauna of the Boone limestone from the Joplin district, and on the fauna of the Louisiana limestone of northeastern Missouri. The Geological Survey in cooperation with members of the Missouri Bureau of Geology and Mines discovered outcrops of fossiliferous Upper Cretaceous beds near Ardeola.

Montana.—Reports on the geology of the Rosebud Creek coal field, Rosebud and Custer Counties, and of the Richey-Lambert coal field, Richland and Dawson Counties, have been approved for publication. A party extended the detailed mapping of the coal beds of a portion of Custer County begun in 1932. A report

for survey publication on the Mizpah coal field of Custer County was almost completed. A reconnaissance areal and structural geologic survey was made of parts of Hill, Chouteau, and Liberty Counties.

The report on the lignite fields of McCone County was advanced, and the report on the geology of the Little Rocky Mountains and the surrounding plains was completed. Studies of the glacial geology and physiography of western Montana, northern Idaho, and eastern Washington were continued in connection with a comprehensive report on the subject. Field and office studies of the gold placers of the Pioneer district were continued, including the examination of phosphate lands near Marysville. Areal mapping and study of mines in the Libby and Troy districts of northwestern Montana were continued and considerable progress was made on detailed reports on the districts. Travertine deposits were examined near Gardner, the report on which will appear as a circular under the title "Some Deposits of Ornamental Stone in Montana." An examination and report on the Mission Creek dam site, Lake County, was made for the Office of Indian Affairs. A geologic map of the State is being compiled in cooperation with the Montana Bureau of Mines and Geology. A correlation chart in two sheets was issued. Work on Fort Union fossil plants is noted under North Dakota, and on source sediments of petroleum under "General studies."

Nebraska.—A reconnaissance of certain Pleistocene deposits in Nebraska was made in connection with a cooperative study of ground-water supplies by the water-resources branch and the State conservation and survey division.

Nevada.—In cooperation with the Nevada Bureau of Mines investigations of some mining districts in the State were continued. Field work was conducted in a resurvey of the Eureka district begun last year and examinations were made in the Tuscarora district and in the Mountain City district in Elko County. The geysers near Beowawe were also studied. A report on the Mountain City district was transmitted to the State bureau. Work was continued on the geology and ore deposits of the Tonopah and Tuscarora areas. Field work in the Chief and Delamar mining districts near Caliente was carried on including the collection of specimens for the purpose of determining the extent of magnesite at the brucite deposits. Examinations were made, in cooperation with the Nevada Bureau of Mines, of the effects of Cedar Mountain earthquake of December 1932 and its bearing on the genesis of Basin Range structure.

The report on the Tybo area for publication by the Nevada Bureau of Mines was completed. Progress was made on the detailed reports on the geology and ore deposits of the Ivanpah quadrangle, California and Nevada, and on the geology of the Great Basin. Several investigations were made for the Office of Indian Affairs including an examination and report on the Rio Vista and Weber Dam sites, in the Walker Indian Reservation, a preliminary examination of two dam sites in the western Shoshone Indian Reservation, and a final examination and report on these sites. A special examination of mining claims in the Duck Valley project was also conducted.

New Jersey.—Several localities in New Jersey for the purpose of collecting Cretaceous and Tertiary Foraminifera were visited.

New Mexico.—The report on the geology and mineral resources of the Santa Rita district was completed and submitted for publication as a survey bulletin. Work was continued on the report of the geology and ore deposits of the Magdalena district. The Geological Survey continued its studies of the Central mining district, Grant County, in cooperation with the New Mexico Bureau of Mines and Mineral Resources. The report on the Mount Taylor coal field, which will form part of a bulletin on the geology and fuel resources of the southern San Juan Basin, was completed, and a report on the coal fields of that part of the San Juan area extending from the Nacimiento Mountains westward including portions of

McKinley, Sandoval, and San Juan Counties, is nearing completion. A map showing the geologic structure of an area in the basin covering parts of McKinley, San Juan, Sandoval, Bernalillo, and Valencia Counties, was issued during the year. Preparation of the report on the Mount Taylor volcanic field, which comprises a study of the structural geology, was continued. Further field studies in the San Juan Basin region begun early in the summer of 1933 and consisting of detailed mapping for the purpose of determining the coal resources and oil possibilities of an area along the east flank of the basin from Cuba north to the State line were prosecuted.

The work on the Abo fauna of the Sacramento Mountains was continued during the year. Studies of the Permian of eastern New Mexico are included under Texas.

New York.—Work in the Taconic quadrangle is noted under Massachusetts.

North Carolina.—The diatoms, mollusks, and foraminifers from test water wells in and near Elizabeth City are being studied, the results to be published in an unofficial medium.

North Dakota.—Work was continued in the preparation of a report on fossil plants from the Fort Union and associated formations, based on collections from North Dakota, Montana, and Wyoming.

Oklahoma.—Revision of the report on the geology and economic resources of the McAlester coal field was completed during the year and work was also continued on a report on the Howe-Wilburton field. A preliminary map showing the coal beds and mines of the McAlester district was issued. Studies of the fossil flora of the coal fields of eastern Oklahoma were continued. A paper on the Moorefield fauna is in the course of preparation. Desirable drilling sites for gas wells in an area in Osage County, for the Office of Indian Affairs were reported upon by the Survey.

Oregon.—Several reports were in course of preparation or publication during the year as a result of studies previously carried on in cooperation with the Oregon State Mining Board. The report on the Robertson, Humdinger, and other mines of southwestern Oregon was issued as Bulletin 830-B. The report on the Takilma-Waldo and Blue Creek districts is in press as Bulletin 846-B, and the report on copper deposits in the Squaw Creek and Silver Peak districts and at the Almeda mine, southwestern Oregon, with notes on the Pennell & Farmer and Banfield prospects, will appear as circular 2. A report on some mining districts of eastern Oregon with a chapter on the Ochoco district is in press as Bulletin 846-A, and a bulletin on quicksilver deposits of southwestern Oregon has been submitted for publication. A report is also nearly finished on the geology of the Baker quadrangle including a short paper on greenstones of eastern Oregon. The report on metalliferous mineral deposits of the Cascade Range in Oregon was completed for official publication. Studies of diatoms of eastern Oregon were continued.

Pennsylvania.—Work on cooperative projects with the Pennsylvania Topographic and Geologic Survey included preparation of a report on the geology of the York and Hanover quadrangles, and field work in a study of the structure of the Reading and Boyertown Hills, for a detailed report in preparation on the geology of the Reading and Boyertown quadrangles. Progress was made on the reports on the geology and mineral resources of the Butler and Zelienople quadrangles and the geology and mineral resources of the Tyrone quadrangle. Studies on the effect of progressive metamorphism in the Lower Kittanning coal beds of Pennsylvania were continued.

South Carolina.—Manuscript of report on the geology of the Coastal Plain of South Carolina was completed.

South Dakota.—A paper on a lower Lance florule from Harding County was completed for survey publication.

Tennessee.—In connection with the studies of the Appalachian lead and zinc deposits, visits were made to some zinc mines at Mascot and Jefferson City. A map showing the mineral resources of the Tennessee River Basin has been compiled and is in press.

Texas.—The compilation of the cooperative geologic map of Texas progressed during the year. A monograph on the Midway fauna of Texas was completed and transmitted to the Texas Bureau of Economic Geology for publication. Stratigraphic studies in the Tertiary near Laredo were also continued in cooperation with the water-resources branch. Further studies of the geology of the Diablo Plateau region, southwestern Texas, are in progress. Work on source sediments of petroleum is noted under "General studies" (Trask), on the genus *Diploschiza* under Alabama, and on the Southern Pacific guidebook under Arizona.

Utah.—Reports on the geology of the Salt Valley anticline and the northwestern flank of the Uncompahgre Plateau, Grand County; on the Monument Valley-Navajo region of San Juan County; on the geomorphology of the north flank of the Uinta Mountains; and on the Gold Hill quadrangle were completed for survey publication. A preliminary map showing the geologic structure of parts of Emery, Wayne, and Garfield Counties was issued.

Work was continued in preparation of the report on the Green River Desert and the eastern flank of the San Rafael Swell and the field work necessary for the preparation of a preliminary geologic structure contour map of southeastern Utah was completed. Additional field mapping of the geology of a portion of the Wasatch Plateau, with special reference to the coals, was done. Field work was conducted for a short time in connection with studies on correlation of the geologic formations of the Colorado Plateau region of southern Utah. A correlation chart in two sheets was issued. Work on the Paradox formation is noted in other sections of the report.

Vermont.—Studies were continued on the geologic structure of the State. Field work was conducted and study made of certain problems in metamorphic geology in east-central Vermont. Work in the Taconic quadrangle is noted under Massachusetts.

Virginia.—In cooperation with the State Geological Survey further field and office studies were made for a report on the geology of the Appalachian Valley in Virginia to be published by the State. Detailed mapping of the Abingdon quadrangle was continued and a brief field examination in southwestern Virginia was made in connection with investigations of the lead and zinc deposits, the report on which has been transmitted to the State. Preparation was continued of a paper on the titanium deposits of Nelson and Amherst Counties.

Washington.—A chapter on copper in Washington was written for the volume on copper by the International Geological Congress. Investigations of the glacial geology and geomorphology of eastern Washington are noted under Montana.

Wisconsin.—Work in the Lake Superior iron-ore region is noted under Michigan.

Wyoming.—Field and office work were continued on the geology of the Afton quadrangle with special reference to the occurrence of phosphate. The work of preparing the report on the Tertiary rocks of the Green River Basin was also continued. In the summer of 1933 a field study was started of the oil-shale deposits of the Fossil and Washakie Basins of southwestern Wyoming. Studies of the Tempskyas of the Wyan and Aspen deposits of southwestern Wyoming and southeastern Idaho were prosecuted during the year.

WORK IN CHEMISTRY AND PHYSICS

The work in chemistry and physics includes the chemical analysis of rocks, ores, and minerals collected by geologists, tests necessary to identify specimens received by the Survey, descriptive mineralogy, including studies of the physical and chemical properties of minerals and ores, their genesis and geochemical relationships, and measurements of deep earth temperature. Among the materials analyzed in the laboratory during the year were 15 igneous rocks from mining districts in Colorado and Nevada, 2 tallow clays from Arkansas, 7 siderites from Idaho, and about 30 dolomites, 14 clays, 29 phosphates, and 40 separate minerals, including potash minerals, from different localities throughout the country.

During the year 5,464 examinations were made by the section of chemistry and physics, of which 1,722 were identifications of potash and related minerals by the petrographic microscope. The potash work also required 437 qualitative tests and 286 quantitative analyses, making in all 2,445 tests for potash. Identifications of specimens submitted by persons not officially connected with the Survey numbered 1,051. The remaining 1,489 qualitative tests and 479 quantitative analyses were made chiefly in response to direct requests by geologists and partly in connection with chemical and physical studies involving methods of analysis and geochemical investigations.

ALASKAN BRANCH

The Geological Survey's work in Alaska has two rather distinct phases—one of a general investigational and research type and the other of a semiadministrative type in connection with the technical supervision of the leases granted by the Government covering coal, oil, or other mineral lands.

Manuscripts and publications.—During the year 5 reports and 1 map have been published and the following maps were issued in preliminary photolithographic editions:

Wrangell district ($55^{\circ}26'-56^{\circ}31'$; $131^{\circ}45'-133^{\circ}15'$).

Tonsina district ($61^{\circ}2'-62^{\circ}$; $144^{\circ}55'-146^{\circ}25'$).

Anthracite Ridge ($61^{\circ}46'31''-61^{\circ}51'1''$; $148^{\circ}3'52''-148^{\circ}11'21''$).

Kodiak and vicinity ($57^{\circ}21'-58^{\circ}1'$; $152^{\circ}8'-153^{\circ}12'$).

In addition, 23 manuscript reports (including maps) and 2 separate manuscript maps have been completed by their authors and are in various stages of proof or preparation for publication. At the end of the year 7 manuscript reports and 4 manuscript maps were partly completed.

Work on mineral resources.—In addition to the routine duties of administration 11 principal projects, 7 of which involved field work, were carried on during the season of 1932. The 7 field projects were reconnaissance topographic mapping in the northern part of the Ketchikan and Wrangell districts, southeastern Alaska; mineral investigations in the Taku district, southeastern Alaska; reconnaissance geologic mapping in the Tonsina district, in the west-central part of the Copper River Valley; reconnaissance topographic mapping in the Slana-

Suslota Pass district, at the head of the Copper River Valley, and at scattered points along the Richardson Highway; reconnaissance topographic mapping in the northern part of Kodiak Island, southwestern Alaska; reconnaissance of portions of southwestern Alaska and the Aleutian Islands, in connection with a Navy Department expedition; general reconnaissance of recent mining developments, particularly in central Alaska and Seward Peninsula.

During the year a little more than 1,000 square miles of new drainage base was compiled from aerial photographs taken by the Navy Department in 1926 and 1929. This covered part of the region north and west of Wrangell, in southeastern Alaska, and was prepared for one of the topographic projects for the season of 1933. Work on the comprehensive report on the large tract of country lying west of the international boundary and between the Yukon and Tanana Rivers, based on the field work done in the past 30 years, was continued.

Owing to the severe curtailment of funds for the fiscal year 1932-33 and the even more drastic curtailments for 1933-34, together with the necessity of suspending new work until various pending matters of policy and procedure were settled, only three field projects were started before the end of the fiscal year, and the personnel of two of these had not reached the field by June 30. One of these projects involved detailed topographic mapping in the Aleutian Islands in connection with investigations by the Navy Department. The other two projects are a continuation of the reconnaissance topographic mapping in the Wrangell and Ketchikan districts of southeastern Alaska, and a geologic reconnaissance of the mining camps in central Alaska, especially in the Ruby, Poorman, Innoko, and Iditarod districts.

At the end of the fiscal year the preparation of a comprehensive summary of all the available information regarding the geology and mineral resources of the Chitina Valley and adjacent parts of the Copper River region had been begun.

TOPOGRAPHIC BRANCH

GENERAL OFFICE WORK

Necessary office work incidental to the field work of the topographic branch consisted in the inking, inspection, and editing of the completed topographic field sheets prior to their submission for reproduction and the computation and adjustment of the results of control field work.

The status of topographic surveys shows that the country as a whole is now 45.6 percent mapped, the year's increment amounting to 0.4 percent. There was a large increase in the area covered by topographic base maps without contours prepared from aerial photographs after field examinations and an increase in the area mapped by stereophotogrammetric methods. The resurveys in large part covered areas previously surveyed on a smaller scale.

New topographic surveys of the United States, July 1, 1932, to June 30, 1933, and total area surveyed in each State

State	Publication contour interval (feet)	Mapped in fiscal year (square miles) (engraved publication unless otherwise stated) for publication on scale of 1 to—						Total area mapped in fiscal year (square miles)			Total area mapped to June 30, 1933 (square miles)	Percentage of total area of State mapped to June 30, 1933	Spirit levels (miles)	Transit traverse (miles)	Triangulation stations occupied
		12,000 or larger	24,000	31,680	48,000	62,500	125,000	250,000	Revision	Resurvey					
Alabama.....	25, 100					212	200			223	21,491	41.3	39		9
Arizona.....	5, 10, 50					711				189	59,339	52.1	440		
Arkansas.....	5, 25, 50, 100					a 425	4,018			1,332	22,685	42.5	1,589	48	
California.....	50	269	544		665	20			2,824	22	132,137	83.5		130	68
Colorado.....											56,342	84.2			
Connecticut.....											4,965	100.0			
Delaware.....											2,370	100.0			
District of Columbia.....											70	100.0			
Florida.....											4,718	8.0			
Georgia.....	100										24,937	42.1			
Idaho.....	5, 10, 20						190		69	121	32,684	39.0	416		26
Illinois.....		73			1,534				1	467	36,601	64.6	269		
Indiana.....											3,668	10.1			
Iowa.....											13,167	23.5			
Kansas.....											64,159	78.1			
Kentucky.....											25,620	65.6			
Louisiana.....	5, 10, 20	b 3,964			12	1,806				12	9,933	20.5			10
Maine.....										1,806	20,773	62.9	491	1,128	12
Maryland.....											12,327	100.0			
Massachusetts.....	10		29						29		8,265	100.0	60	379	62
Michigan.....			b 3,118			117					14,069	24.3			
Minnesota.....	2, 10, 20	(b c)								117	8,157	9.6	18	1	
Mississippi.....	5, 10, 20		193		1,355				4	741	40,793	67.4		618	
Missouri.....	100				b c 840		364			803	43,452	29.6			
Montana.....											27,117	35.0			
Nebraska.....											53,334	48.2			
Nevada.....	100					534		2,654		534	9,302	100.0	61		
New Hampshire.....	20										8,224	100.0			
New Jersey.....											42,917	35.0		355	28
New Mexico.....	20, 100					112	355			467	49,204	100.0	85		
New York.....	5, 10, 20	286	13			212			511		19,040	36.3	58		19
North Carolina.....	50					79			79		13,148	18.6			
North Dakota.....											41,040	100.0			
Ohio.....											41,927	59.8			
Oklahoma.....															

^a Includes 192 square miles mapped from aerial photographs by means of stereophotogrammetry.^b Lithographic publication only.^c Culture, drainage, and woodland prepared from aerial photographs, after field examination. Contours not added.^d 0.3 square mile mapped on scale of 1:1,200.

New topographic surveys of the United States, July 1, 1932, to June 30, 1933, and total area surveyed in each State—Continued

State	Publication contour interval (feet)	Mapped in fiscal year (square miles) (engraved publication unless otherwise stated) for publication on scale of 1 to—							Total area mapped in fiscal year (square miles)			Total area mapped to June 30, 1933 (square miles)	Percentage of total area of State mapped to June 30, 1933	Spirit levels (miles)	Transit traverse (miles)	Triangulation stations occupied
		12,000 or larger	24,000	31,680	48,000	62,500	125,000	250,000	Revis- sion	Restur- vey	New sur- vey					
Oregon.....	100						1,139			885	254	36,460	37.7	103		
Pennsylvania.....	20					389					389	38,228	84.7	313	116	6
Rhode Island.....												1,248	100.0			
South Carolina.....												13,737	44.3	13	24	
South Dakota.....	50											19,243	24.8			
Tennessee.....	50					143				143		23,627	56.2			
Texas.....	20, 50					209					209	88,493	33.3	149		15
Utah.....	50					218					265	19,822	23.3			
Vermont.....	20					179				9	179	8,139	85.1	33		
Virginia.....	10, 20		28			481				515		37,897	88.9		323	128
Washington.....	100						402				402	37,915	53.8			
West Virginia.....	10					5				5		24,170	100.0			
Wisconsin.....	100						524			225	299	19,135	34.2			
Wyoming.....												31,608	32.3	21		
Total continental United States (exclusive of Alaska).....		6	821	7,773	965	8,762	7,192	2,654	2,908	5,720	11,563	1,380,772	45.6	4,775	3,622	413
Hawaii.....												6,435	100.0			

^a Lithographic publication only.^c Includes 32 square miles mapped from aerial photographs by means of stereophotogrammetry.^f Mapped on scale of 1:12,600.

FIELD SURVEYS

Arizona.—The survey of the Camp Verde 30' quadrangle for the Forest Service was completed. The survey of the Quartzite No. 3 15' quadrangle was begun for the Office of Indian Affairs.

Arkansas.—In cooperation with the United States Army district engineer at Vicksburg, Miss., the survey of the Felsenthal, Moro Bay, Ingalls, and Dilolo 15' quadrangles was begun. For the Forest Service the survey of the Mount Judea 15' quadrangle was begun.

California.—In cooperation with the State engineer of California the survey of the Healdsburg 15' quadrangle, the No. 39, No. 40, No. 41, Treadwell, Guajarral Hills, Huron, Corona 1-a, Corona 1-b, Corona 1-c, Corona 1-d, Cucamonga No. 2, Cucamonga No. 3, and Cucamonga No. 4 7½' quadrangles was completed, that of the Tobias Peak 30' quadrangle, the Lakeport 15' quadrangle, and the Cucamonga No. 1 7½' quadrangle was begun, and the revision of the Colfax, Truckee, and Bartle 30' quadrangles was completed. In cooperation with the county surveyor of Los Angeles County the survey of the Mint Canyon, Beartrap Canyon, Fairmont, Hughes Lake, Lake, Neenach, Quail, Palmdale, Manzanita, Black Mountain, and Gorman 6' quadrangles was completed and that of the La Crescenta, Sierra Madre, La Verne, and Glendora 6' quadrangles was continued. At the request of the Forest Service the survey of the Hoaglin 30' quadrangle was completed, that of the Yreka 30' quadrangle was continued, and that of the Dixie and South Fork Peak 30' quadrangles was begun.

Colorado.—In cooperation with the Colorado Metal Mining Fund and the Colorado Geological Survey Board, the survey of Independence Pass and vicinity was completed and that of the Como No. 1 and Como No. 2 15' quadrangles was begun. For the Forest Service the survey of the Mount Powell No. 2 15' quadrangle was continued.

Idaho.—The survey of the Trout Creek 30' quadrangle was completed at the request of the Forest Service. In preparation for geologic mapping the survey of the Irwin 30' quadrangle was completed.

Illinois.—The survey of the Pecatonica, Harvard, Marshall, Lomax, Nashville, Keokuk, Jacksonville, Orion, Potomac, Virginia, Prophetstown, and Fort Madison 15' quadrangles and the Collinsville, O'Fallon, Lebanon, and New Athens No. 2 7½' quadrangles was completed, that of the Morrison, Lacon, Petersburg, Mendon, Toledo, Camp Grove, Mount Vernon, Hoopeston, Carthage, and Genoa 15' quadrangles was continued, and that of the Toluca 15' quadrangle was begun. This work was done in cooperation with the Department of Registration and Education of Illinois, Geological Survey.

Louisiana.—The Louisiana Board of State Engineers cooperating, the ground control, field examination, and preparation from aerial photographs of culture, drainage, and woodland was completed for topographic base maps without contours for the 7½' quadrangles within the New Orleans, Cut-Off, Houma, Hahnville, Thibodaux, Lac des Allemands, Gibson, Schooner Bayou, Bossier, Shreveport, Plain Dealing, Hosston, Boyce, Abbeville, and Colfax 15' quadrangles and begun for the 7½' quadrangles within the Pecan Island, Redfish Point, Hayes, Bayou Bois Courier, Port Arthur, Sabine Pass, Johnsons Bayou, Hackberry, Lake Arthur, Lake Charles, Orange, Vincent, Marsh Island, Lake Misericorde, BBB, CCC, and FFF 15' quadrangles. In cooperation with the United States Army district engineer at Vicksburg, Miss., the survey of the Felsenthal 15' quadrangle was begun.

Maine.—In cooperation with the Public Utilities Commission of Maine, the survey of the Nicatous Lake, Allagash Falls, Umsaskis Lake, Musquacook Lakes, Dover-Foxcroft, Kennebec Lake, Presque Isle, and Guilford 15' quadrangles

was completed and that of the Rangeley 15' quadrangle was begun. In cooperation with the War Department the survey of the Frenchville, Arnold Pond, and Fort Kent 15' quadrangles was completed and that of the Grand Isle and Mars Hill 15' quadrangles was begun.

Massachusetts.—In cooperation with the Massachusetts Department of Public Works, Division of Waterways, the survey of the Sagamore 7½' quadrangle was begun.

Michigan.—In cooperation with the Department of Conservation of Michigan, Geological Survey, the ground control, field examination, and preparation from aerial photographs of culture, drainage, and woodland was executed in 7½' quadrangles for topographic base maps without contours for Mackinac County, within the St. Ignace and Bois Blanc 15' quadrangles and the county parts of the Ozark, Rudyard, Pickford, Beavertail Point, and Raber 15' quadrangles; for Lake County, completing the county parts of the Baldwin, Chase, Peacock, Freesoil, and Luther 15' quadrangles; for Mason County, completing the county parts of the Manistree and Freesoil 15' quadrangles; for Delta County, completing the Burnt Bluff, Peninsula Point, Escanaba, Gladstone, Rapid River, and Garden 15' quadrangles and the county parts of the Bark River, Whitney, Rock, Trenary, and Skeels Lake 15' quadrangles; for Marquette County, completing the Helena and Harvey 15' quadrangles and the county parts of the Rock, Skandia, and Whitney 15' quadrangles and beginning the Ishpeming, Michigamme, Eagle Mills, Witbeck, Marquette, and Humboldt 15' quadrangles; and for Wexford County beginning the Mesick 15' quadrangle and the county parts of the Cope-mish, Manton, Tustin, Kingsley, Thompsonville, Fife Lake, Luther, and Peacock 15' quadrangles.

Minnesota.—At the request of the Forest Service the survey of the Ely 15' quadrangle was continued. In cooperation with the Department of Justice the site of a proposed Federal detention farm near Sandstone was surveyed.

Missouri.—The survey of the Piedmont and Iberia 15' quadrangles and the Granite City and Cahokia 7½' quadrangles was completed, that of the Manchester, Sleeper, Long Lane, Upalika, Buffalo, Grove Spring, Thornfield, Niangua, Steelville, Topaz, Gatewood, Edgar Springs, and Big Piney 15' quadrangles was continued, and that of the Springfield No. 1, Springfield No. 4, Tuscumbia No. 1, Tuscumbia No. 4, Versailles No. 4, Sullivan No. 3, Sullivan No. 4, Morrison, Linn, Stone Hill, Berryman, Mokane, Canaan, Richland, Grandin, and Marble Hill 15' quadrangles and the West St. Louis No. 1, West St. Louis No. 2, West St. Louis No. 3, and West St. Louis No. 4 7½' quadrangles was begun, in cooperation with the State geologist of Missouri.

Montana.—The survey of the Trout Creek 30' quadrangle was completed and that of the Thompson 30' quadrangle was begun at the request of the Forest Service. The Bureau of Mines and Geology of Montana cooperating, the compilation from aerial photographs of the culture and drainage was completed for the Nye No. 1, Nye No. 2, Red Lodge No. 1, and Red Lodge No. 2 15' quadrangles.

Nevada.—The survey of the Sonoma Range 1° quadrangle was completed and that of the Morey Peak 1° quadrangle was begun in cooperation with the Bureau of Mines of Nevada.

New Hampshire.—In cooperation with the Highway Department of New Hampshire the survey of the Keene, Monadnock, Newburyport, Winchendon, Warwick, Brattleboro, Berwick, and Newfield 15' quadrangles was completed.

New Mexico.—For the Forest Service the survey of the Talpa 30' quadrangle was continued. At the request of the Office of Indian Affairs the survey of the Shiprock No. 2 15' was continued.

New York.—The survey of the Tarrytown No. 4 $7\frac{1}{2}'$ quadrangle was completed and that of the Catskill and Rhinebeck 15' quadrangles was begun in cooperation with the Department of Public Works of New York. In cooperation with Monroe County and the Department of Public Works of New York the survey of the Spencerport, Brockport, Churchville, Clifton, Webster, Fairport, Hilton, Hamlin, Honeoye Falls, Caledonia No. 1, Caledonia No. 2, and Canandaigua No. 2 $7\frac{1}{2}'$ quadrangles within Montee County was completed.

North Carolina.—The survey of the Sassafras Mountain 15' quadrangle was completed and that of the Ranger 15' quadrangle was begun at the request of the Forest Service.

Oregon.—The survey of the Medford 30' quadrangle was completed in cooperation with the State engineer of Oregon. In preparation for geologic mapping the survey of the Dayville 30' quadrangle was completed.

Pennsylvania.—In cooperation with the Department of Internal Affairs of Pennsylvania, Topographic and Geologic Survey, the survey of the Susquehanna and Genesee 15' quadrangles was completed and that of the Smethport and Coudersport 15' quadrangles was begun.

Tennessee.—The survey of the Sassafras Mountain and Ranger 15' quadrangles was completed at the request of the Forest Service.

Texas.—In preparation for geologic mapping the survey of the Guadalupe Peak No. 2 15' quadrangle was begun.

Utah.—The survey of the Bryce Canyon National Park and an extension of Zion National Park was completed for the National Park Service. In preparation for geologic mapping the survey of the Sevier 15' quadrangle was completed.

Vermont.—In cooperation with the State geologist of Vermont the survey of the Littleton, Keene, and Warwick 15' quadrangles was completed and that of the Guildhall 15' quadrangle was begun.

Virginia.—The survey of the Lexington, Blacksburg, Peterstown, and Pearisburg 15' quadrangles and the Yellow Tavern $7\frac{1}{2}'$ quadrangle was completed and that of the Radford, Pulaski, Waiteville 15' quadrangles and the Gaines Mill, Cold Harbor, and Mechanicsville Battlefields was begun in cooperation with the Conservation and Development Commission of Virginia, Geological Survey.

Washington.—For the Forest Service the survey of the Eatonville 30' quadrangle was continued. In preparation for geologic mapping the survey of the Metaline 30' quadrangle was continued.

Wisconsin.—The survey of the Harvard 15' quadrangle was completed.

Wyoming.—The survey of the Savery Creek 30' quadrangle was continued at the request of the Forest Service.

WATER-RESOURCES BRANCH

Work in the branch is largely conducted in cooperation with Federal bureaus; State, county, municipal, and other governmental agencies; and permittees and licensees of the Federal Power Commission. A major part of this cooperation is set forth below.

States.—The following amounts were expended by States and municipalities from cooperative allotments for surface- and ground-water investigations. In addition, it is estimated that data valued at over \$141,000 were furnished by cooperating officials.

Cooperative funds expended by States and municipalities for work on water resources

State	State expenditures		Municipal expenditures		Total
	Surface water	Ground water	Surface water	Ground water	
Arizona.....	\$20,977.08				\$20,977.08
Arkansas.....	1,091.62	\$400.79			1,492.41
California.....	34,990.02		\$6,050.73	\$13,753.00	54,793.75
Connecticut.....	7,890.60				7,890.60
Florida.....	2,980.74	3,522.53	2,638.96		9,142.23
Idaho.....	22,947.83				22,947.83
Illinois.....	8,915.53				8,915.53
Indiana.....	3,999.11		428.31		4,427.42
Iowa.....	3,191.44				3,191.44
Kansas.....	7,240.83				7,240.83
Louisiana.....	887.63				887.63
Maine.....	6,348.47				6,348.47
Maryland.....	6,716.34		1,550.76		8,267.10
Massachusetts.....	4,345.10				4,345.10
Michigan.....	2,006.61	2,705.72			4,712.33
Minnesota.....	1,378.20				1,378.20
Mississippi.....	1,000.00				1,000.00
Missouri.....	7,462.29		173.40		7,635.69
Montana.....	9,430.24				9,430.24
Nebraska.....	14,470.38	3,321.70	248.45		18,040.53
Nevada.....	1,344.16				1,344.16
New Hampshire.....	3,277.50				3,277.50
New Jersey.....	11,471.49	6,564.36			18,035.85
New Mexico.....	12,919.50	2,057.67			14,977.17
New York.....	9,019.28	2,502.14	10,501.91	3,000.00	25,023.33
North Carolina.....	9,857.80	1,437.34			11,295.14
North Dakota.....	3,739.38				3,739.38
Ohio.....	15,250.86		2,009.08		17,259.94
Oregon.....	32,302.10	2,468.01	670.55		35,440.66
Pennsylvania.....	19,464.85	323.39			19,788.24
South Carolina.....	3,993.96		317.77		4,311.73
Tennessee.....	14,961.86	294.39			15,256.25
Texas.....	27,543.99	23,190.39			50,734.38
Utah.....	6,017.90		180.18	7,797.24	13,995.32
Vermont.....	5,625.65				5,625.65
Virginia.....	18,907.75	1,613.57			20,521.32
Washington.....	8,491.28		5,268.25		13,759.53
West Virginia.....	3,500.99				3,500.99
Wisconsin.....	6,758.95				6,758.95
Wyoming.....	11,472.52				11,472.52
Hawaii.....	19,973.06	5,833.05			25,806.11
	414,164.89	56,235.05	30,038.35	24,550.24	524,988.53

The study of surface waters, which consists of the measurement of the flow of rivers, has been conducted in 48 States, the District of Columbia, and Hawaii at selected gaging stations where the volume of water is measured and records of stage and other data are collected, from which the daily discharge of the rivers is computed. In the maintenance of the regular gaging stations 40 States, the Territory of Hawaii, and several Government organizations and individuals cooperated. At the end of the year 2,801 gaging stations were being maintained. Records for about 129 additional stations were received, ready for publication, from Government bureaus and private persons.

The division of ground water investigates the waters that lie below the surface in the zone of saturation (from which the wells and springs are supplied); the source, occurrence, quantity, and head of these waters; their conservation; their availability and adequacy for domestic, industrial, irrigation, and public supplies and as watering

places for livestock and desert travelers; and the methods of constructing wells and recovering water from them and of improving springs. Each year surveys are made of selected area where problems of water supply are urgent, and the results are generally published in water-supply papers that include maps showing the ground-water conditions. The investigations relating to the chemical composition of the water are made in cooperation with the division of quality of water. Projects involving large expenditures for drilling wells to develop water supplies are considered each year by the several departments of the United States Government, and the ground-water division is called upon to furnish information and advice on many of these projects. During the fiscal year about 50 investigations relating to ground water and reservoir sites were in progress, and work was done in 19 States and the Territory of Hawaii, nearly all of it in cooperation with State or local governmental agencies. In the hydrologic laboratory 496 samples of water-bearing material were analyzed.

The work on the quality of water included the analysis of the mineral content of 1,034 samples of water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural uses and for domestic use (not related to questions of health), so far as such use is affected by the dissolved mineral matter. The analyses included some for nearly all the studies of ground water in the different States.

The work of the division of power resources comprised the preparation of monthly reports on the production of electricity for public use and the consumption of fuel in generating the electricity reported, an annual report containing revised figures of the monthly production of electricity and consumption of fuel in 1932 previously published in the monthly reports, a report on the developed water power of the United States, and compilations of stocks of coal held by public-utility power plants for inclusion in reports of commercial stocks of coal undertaken quarterly by the Bureau of Mines. The annual report on the capacity of water wheels in water-power plants in the United States was released January 20, 1933, and the final report on the monthly and annual production of electricity for public use in 1932 was released April 27, 1933.

The division of water utilization investigates problems affecting the utilization of the waters of streams and performs administrative work relating to supervision and investigation by the field organization of the water-resources branch and of power projects of the Federal Power Commission and of the Interior Department. The field work is generally conducted by personnel otherwise assigned to the division of surface water.

The operation of about 300 gaging stations was conducted by the branch or was performed by permittees and licensees under the

supervision of the branch in connection with 120 projects of the Federal Power Commission. Engineers of the branch have had general supervision of operations under permits and licenses of the Federal Power Commission in connection with 105 projects.

WORK OF THE YEAR BY STATES

Alabama.—The report on Ground Water in the Paleozoic Rocks of Northern Alabama, prepared in previous years by the survey, was published by the Geological Survey of Alabama as Special Report 16.

Arkansas.—The investigation in the Grand Prairie region was continued in cooperation with the Arkansas Geological Survey and the Arkansas Agricultural Experiment Station. Records were obtained of water levels in numerous observation wells, and these records were released to the public in manuscript form.

California.—Water levels were measured in selected wells in southern California. The record now covers a period of 29 years. The investigation of the ground water in the alluvial fan of the Mokelumne River was continued with the financial support of the East Bay Municipal Utility District. A detailed report on the geology of the area and other results obtained in the investigation were released in manuscript form.

Florida.—Investigation of ground-water resources was continued in cooperation with the Florida Geological Survey. Explorations of artesian wells were made in Sarasota County and other areas by use of the deep-well current meter, salinity apparatus, and samplers. An investigation was made of the ground-water conditions in the Lake Okeechobee area.

Hawaii.—The survey of the ground-water resources of the Hawaiian Islands was continued. A comprehensive report on the Island of Oahu was nearly completed, and a concise statement of results was released in manuscript form. Ground-water work was begun on the Island of Maui.

Idaho.—Progress was made on the final reports on ground water in the Mud Lake region and in the Snake River plain.

Kansas.—An investigation and report on a ground-water supply for the Federal prison at Leavenworth was made.

Maryland.—A brief investigation and report was made to the Bureau of Standards in regard to a ground-water supply for that Bureau at Beltsville.

Michigan.—An investigation was conducted in cooperation with the Michigan Department of Conservation in regard to ground-water conditions in Rosecommon County, with special reference to protection from forest fires.

Montana.—Progress was made on a report on ground water in Fergus County. Observations were continued on water levels in observation wells at the north end of Flathead Lake.

Nebraska.—The investigation of the ground-water resources of the Platte River Valley was continued in cooperation with the Nebraska Conservation and Survey Division.

New Jersey.—Investigation of ground-water resources was continued through cooperation with the New Jersey Water Policy Commission. A report on Ground-water Supplies in the Camden Region, New Jersey was published as bulletin 39.

New Mexico.—Cooperation was continued with the State engineer in studies of ground-water resources. A comprehensive report on the Roswell artesian basin is in press as Water-Supply Paper 639.

New York.—The investigation of the ground-water resources of Long Island was continued in financial cooperation with the joint legislative committee on water resources and with Nassau and Suffolk Counties.

North Carolina.—Observations were continued on fluctuations of water levels in wells with special reference to their effects upon stream flow, and an investigation of the ground-water resources of Elizabeth City region was made in cooperation with the North Carolina Division of Water Resources and Engineering.

Oregon.—Investigations of ground-water resources were continued in cooperation with the Oregon Agricultural Experiment Station. Progress was made on the final report on the Harney Basin, and work was begun in the Milton-Freewater area.

Pennsylvania.—Cooperation was continued on ground-water investigations with the Pennsylvania Topographic and Geologic Survey. Weekly records were obtained of water levels on about 35 observation wells and were released in manuscript form.

Tennessee.—The project of obtaining records of ground-water levels and pumpage in Memphis was continued in cooperation with the Tennessee Division of Geology.

Texas.—Investigations of ground-water resources were continued in cooperation with the Texas Board of Water Engineers. The Texas Department of Health and the Engineering Experiment Station of the Agricultural and Mechanical College also continued to cooperate. Work was continued in the Houston-Galveston, Winter Garden, San Antonio, and west Texas regions, and an investigation of ground-water problems was undertaken in Jim Wells, Kleburg Brooks, Kennedy, and Hidalgo Counties.

Utah.—The investigation of the ground-water resources of the Jordan Valley with special reference to an increased water supply for Salt Lake City was continued in cooperation with Salt Lake City. An investigation of the Ogden artesian basin was begun in cooperation with the city of Ogden.

Virginia.—The investigation of ground-water resources was continued in cooperation with the Virginia Geological Survey. An investigation of the ground-water resources of the Shenandoah Valley was begun. Water-stage recorders were in operation on four observation wells in Arlington and Fairfax Counties and on the ebbing and flowing spring near Marion.

CONSERVATION BRANCH

SUMMARY OF CASES

The activities in the Washington office with respect to land classification include the preparation of reports in response to requests for data or action on specific cases, the preparation of orders of withdrawal and restoration of lands not involved in specific requests, and the promulgation of broad areal classifications.

The following table summarizes activity with respect to requests for data or action on specific cases. The terms "gain" and "loss" signify, respectively, decrease and increase in the number of cases pending. The number of cases received was less by 2,492 (18.6 percent) and the number acted on was less by 545 (2.7 percent) than during the preceding year. The number of cases pending at the end of the year was decreased by about 52 percent.

Summary of cases involving land classification

Class of cases	Record for fiscal year 1933						Record since receipt of first case	
	Pending July 1, 1932	Received during fiscal year	Total	Acted on during fiscal year	Pending June 30, 1933	Gain or loss during fiscal year	Received	Acted on
General Land Office requests:								
General.....	327	1, 203	1, 530	1, 223	307	+20	2, 313	2, 313
Time extensions.....							17, 216	17, 206
Oil development.....	24	130	154	144	10	+14		
Concurrence.....	12	766	778	759	19	-7		
Section 27 cases.....	39		39	39		+39	39	39
Committee cases—Oil and potash.....	147	113	260	257	3	+144	9, 418	9, 415
Applications for classification as to mineral:								
Oil.....	460	2, 619	3, 079	3, 005	74	+386	23, 812	23, 733
Miscellaneous.....	4	37	41	34	7	-3	907	900
Applications for mineral permits.....	776	3, 240	4, 016	3, 938	78	+698	57, 747	57, 669
Applications for mineral leases.....	2	133	135	130	5	-3	1, 877	1, 872
Applications for patent, potassium.....							124	124
Federal Power Commission cases:								
Preliminary permits.....	6	54	60	43	17	-11	283	266
Licenses.....							28	28
Determinations under section 24.....	8	73	81	59	22	-14	425	403
Applications for classification as to power resources.....	21	22	43	33	10	+11	513	503
Applications for agricultural classification.....	74	145	219	182	37	+37	1, 352	1, 315
Application for rights-of-way.....	15	127	142	104	38	-23	6, 876	6, 838
Irrigation project reports.....		11	11	9	2	-2	935	933
Applications under enlarged homestead acts.....	76	118	194	178	16	+60	57, 789	57, 773
Applications under stock-raising homestead acts.....	1, 137	2, 144	3, 281	2, 422	859	+278	139, 452	138, 593
Applications under ground-water reclamation act.....	1	10	11	9	2	-1	981	979
Indian Office requests for information.....							9, 547	9, 547
Total.....	3, 129	10, 945	14, 074	12, 568	1, 506	+1, 623		

SUMMARY OF FIELD OPERATIONS BY STATES

Alaska.—Supervised 1 power project. Expended \$7,000 through the Alaskan branch for supervision of 4 leases, 2 licenses, and 18 prospecting permits for coal, and 91 prospecting permits for oil and gas.

Alabama.—Examined 8 tracts in Conecuh, Madison, Morgan, Winston, Tuscaloosa, Marion, and Colbert Counties for mineral classification. Investigated in the field the status of oil and gas prospecting operations throughout the State. Supervised 1 coal lease.

Arizona.—Supervised 11 power projects and prepared for publication maps of 196 miles of river. Examined 34 tracts for agricultural classification and began a cooperative land-classification study for the State. Supervised on public land 1 lease and 3 prospecting permits for sodium, 6 prospecting permits for potash, and 68 prospecting permits for oil and gas.

Arkansas.—Examined 1 tract each in Crawford and Johnson Counties for mineral classification. Supervised 1 prospecting permit for coal and 15 for oil and gas. No production reported.

California.—In cooperation with the geologic branch continued geologic investigation of the north, middle, and south domes of the Kettleman Hills anticline in Kings and Kern Counties. Supervised 31 power projects and prepared for publication maps of 58 miles of river. Examined 19 tracts for agricultural classification and entered into a cooperative agreement with the city of Los Angeles to continue detailed studies of grazing conditions in Mono Lake

and Owens Valley as an aid in administration of lands withdrawn by the act of March 4, 1931 (46 Stat. 1530). Supervised on public land 3 prospecting permits for coal, 9 prospecting permits for sodium, 4 leases and 5 prospecting permits for potash, 222 leases, 5 suspended rights to leases, and 568 prospecting permits for oil and gas. Prospecting for sodium borate deposits was continued during the year. Drilling was done on 4 holes to a total depth of 2,703 feet. Supervised on naval petroleum reserves 24 leases for oil, and gas.

Colorado.—Made stratigraphic, structural, and economic survey of the North and South McCallum anticlines in Jackson County and prepared structure-contour map of the area examined. In cooperation with the geologic branch completed a stratigraphic and structural reconnaissance of the southern part of the Denver Basin. Supervised 11 power projects. Examined 56 tracts for agricultural classification. Supervised on public land 84 leases, 8 licenses, 49 prospecting permits, and 14 awarded lease applications for coal; 1 prospecting permit for potash; and 25 leases, 3 suspended preference rights to leases, and 428 prospecting permits for oil and gas.

Florida.—Examined 1 tract in Walton County for mineral classification. Investigated in the field the status of oil and gas prospecting operations throughout the State.

Idaho.—In cooperation with the geologic branch continued a detailed geologic survey of the Afton quadrangle, Caribou County. Supervised 6 power projects. Examined 69 tracts for agricultural classification. Supervised 11 coal prospecting permits, 2 phosphate leases, and 71 prospecting permits for oil and gas.

Kansas.—Investigated the status of oil and gas prospecting operations affecting certain Federal lands in Scott and Wallace Counties. Supervised 1 prospecting permit for oil and gas.

Louisiana.—Examined 1 tract each in Beauregard and Calcasieu Parishes for mineral classification. Investigated in the field the status of oil and gas prospecting operations throughout the State, with particular reference to operations affecting Federal lands in Caldwell, Caddo, and Grant Parishes. Supervised 10 leases and 1 prospecting permit for oil and gas.

Mississippi.—Examined 1 tract each in Harrison, Holmes, and Lamar Counties for mineral classification. Investigated in the field the status of oil and gas prospecting operations throughout the State, particularly operations affecting certain Federal lands in Amite, George, Jackson, and Wilkinson Counties.

Montana.—Examined parts of 7 townships in Flathead County for coal classification. Completed detailed areal, structural, and economic surveys of the Cedar Creek anticline in Fallon and Carter Counties and of the Sweetgrass Hills in Toole and Liberty Counties. In cooperation with the geologic branch made areal, structural, and economic surveys of 72 townships in Liberty, Hill, and Chouteau Counties for oil and gas classification and of 13 townships in Custer County for coal classification. Supervised 29 power projects and prepared for publication maps of 120 miles of river. Examined 64 tracts for agricultural classification. Supervised on public land 86 leases, 65 licenses, 40 prospecting permits, and 11 awarded lease applications for coal; 1 prospecting permit for potash; 6 phosphate leases and 3 awarded phosphate leases; and 77 leases, 1 suspended preference right to lease, and 551 prospecting permits for oil and gas. The first shipment of phosphate from Government lease land in Montana was made during the year. Supervised on Indian land on 2 reservations 126 leases for oil and gas.

Nebraska.—Supervised 1 prospecting permit for potash and 1 prospecting permit for oil and gas.

Nevada.—Supervised 6 power projects. Examined 26 tracts for agricultural classification and completed regional investigations of agricultural utility prec-

edent to grazing classification in the northeastern part of the State. Supervised 5 prospecting permits for coal, 2 leases, and 6 prospecting permits for sodium, 1 lease for phosphate, 10 prospecting permits for potash, and 51 prospecting permits for oil and gas.

New Mexico.—Examined parts of 8 townships in Taos County and of 2 townships in McKinley County for coal classification. In cooperation with the geologic branch resumed surveys for coal classification in the eastern part of the San Juan Basin in Rio Arriba and Sandoval Counties. Supervised 3 power projects. Examined 37 tracts for agricultural classification. Supervised on public land 21 leases, 36 prospecting permits, and 1 awarded lease application for coal; 10 prospecting permits for sodium; 9 leases and 160 prospecting permits for potash; 68 leases, 24 suspended preference rights to leases, and 1,054 prospecting permits for oil and gas. Supervised on Indian land 1 coal lease, 13 Indian agency coal mines, and 13 leases for oil and gas. Prospecting for potash in New Mexico resulted in drilling of 20 holes to a total depth of 15,706 feet. Two shafts were started for potash, and one was completed. The total depth of shafts sunk during the year was 1,250 feet. A refinery was completed in September 1932 for treating potash salts, and the first shipment of muriate was made September 22.

North Dakota.—Completed a detailed areal, structural, and economic survey of the Cedar Creek anticline in Billings and Bowman Counties. Supervised 69 leases, 20 licenses, 1 prospecting permit, and 4 awarded lease applications for coal, 1 prospecting permit for sodium, and 19 prospecting permits for oil and gas.

Oklahoma.—Investigated oil and gas prospecting operations affecting certain Federal lands in Cimarron, Dewey, Ellis, Harper, Kingfisher, Major, and McClain Counties. Supervised 1 power project. Supervised on public land 17 leases and 13 prospecting permits for oil and gas. Supervised on Indian lands on 21 reservations 65 coal leases, 7 coal prospecting permits, 41 lead and zinc leases, and 5,003 leases for oil and gas. Made 6,588 investigations of oil and gas leases on Indian lands for regulatory, inspectional, and appraisal purposes.

Oregon.—Examined and reported on the geologic features of two dam sites on the Walla Walla River in Umatilla County. Prepared manuscript report on water-power resources of the Walla Walla River and prepared for publication maps of 80 miles of river, investigated power and storage possibilities of the White and Hood Rivers and surveyed 75 miles of river. Made reconnaissance investigation of power possibilities of the Chetco River. Investigated depth to bedrock at three dam sites by geophysical methods. Supervised 4 power projects. Examined 37 tracts for agricultural classification. Supervised 2 leases and 10 prospecting permits for coal, 1 lease for oil shale, 2 prospecting permits for potash, and 24 prospecting permits for oil and gas.

South Dakota.—Completed a detailed areal, structural, and economic survey of the Cedar Creek anticline in Harding County. Examined 1 tract in Perkins County for oil and gas classification. Supervised 4 leases, 2 prospecting permits for coal, and 25 prospecting permits for oil and gas.

Utah.—Made detailed areal and structural survey of the Harley dome, Grand County, and of the part of Petroleum Reserve No. 7 in Washington County, and prepared and published a structure-contour map of the Harley dome. In cooperation with the geologic branch continued areal and structural surveys in Emery and Wayne Counties. Supervised 8 power projects. Examined 68 tracts for agricultural classification. Supervised on public land 41 leases, 2 licenses, and 75 prospecting permits for coal; 43 prospecting permits for potash; 11 leases, 2 suspended preference rights to leases, and 513 prospecting permits for oil and gas. Supervised on Indian land on 1 reservation 3 agency coal mines, and under Navajo Executive order 1 lease for oil and gas.

Washington.—Investigated status of oil and gas drilling operations. Supervised 10 power projects and surveyed 175 miles of river. Investigated storage

and power possibilities on the Queets, Clearwater, Duckabush, Dosewallips, Hamma Hamma, and North Fork of Nooksack Rivers, Wells Creek, and Glacier Creek. Investigated depth to bedrock at two dam sites by geophysical methods. Examined 4 tracts for agricultural classification. Supervised 22 prospecting permits for coal, 1 prospecting permit for sodium, and 5 prospecting permits for oil and gas.

Wyoming.—Examined 1 tract each in Sublette and Teton Counties for phosphate classification and 1 coal area in Johnson County for leasing-law administration. In cooperation with the geologic branch continued a detailed geologic survey of the Afton quadrangle, Lincoln County. Supervised 4 power projects. Examined 163 tracts for agricultural classification. Supervised on public land for coal 41 leases, 22 licenses, 51 prospecting permits, 9 awarded lease applications, 402 leases, 16 suspended preference rights to leases, and 945 prospecting permits for oil and gas. Made 231 analyses of water, 45 of oil, 14 of gas, and 25,750 determinations of oil gravity. Made periodic inspections and pressure test of wells shut in on Naval Petroleum Reserve No. 3 and supervised operations for mudding and plugging certain wells that were in an unsatisfactory condition. Supervised on Indian land on 1 reservation, 41 leases for oil and gas.

MINERAL CLASSIFICATION DIVISION

The work of the mineral classification division includes field determination of the economic geology of lands belonging to the United States and office conversion of the technical data obtained into forms adapted to the needs of public land law administration.

Field investigations made for purposes of mineral classification during the fiscal year 1933 by division personnel or on a cooperative basis by personnel of the geologic branch are included in the preceding summary of field operations by States. Office activities show a decrease of 1,318, or 15 percent, in the number of requests for mineral determination received and an increase of 745, or 9 percent, in the number of such reports rendered. Progress during the year in classifying the vast areas of public land still withdrawn for mineral classification is shown in the following table:

Summary of outstanding mineral withdrawals and classifications, June 30, 1933, in acres

State	Coal		Oil	
	Withdrawn	Classified as coal land	Withdrawn	Classified as oil land
Alaska.....		56,993		
Arizona.....	139,415			
Arkansas.....		61,160		
California.....	17,603	8,720	1,178,392	
Colorado.....	4,142,233	3,082,272	215,370	
Idaho.....	11,520	4,603		
Louisiana.....			466,990	4,233
Montana.....	6,442,830	¹ 9,254,927	1,336,697	67,651
Nevada.....	83,673			
New Mexico.....	5,061,011	579,638		
North Dakota.....	5,954,364	11,178,286	84,894	
Oregon.....	4,361	18,887		
South Dakota.....		250,093		
Utah.....	3,404,043	1,267,697	1,341,264	
Washington.....	691,801	141,444		
Wyoming.....	2,260,604	² 6,740,594	541,777	
Total.....	28,213,458	32,645,314	5,165,384	71,884

¹ Includes 3,151 acres of coal land reserved for use of the United States (coal reserve no. 1).

² Includes 2,078 acres of coal land reserved for use of the United States (coal reserve no. 2).

Summary of outstanding mineral withdrawals and classifications, June 30, 1933,
in acres—Continued

State	Oil shale		Phosphate		Potash
	Withdrawn	Classified as oil-shale land	Withdrawn	Classified as phosphate land	Withdrawn
California.....					90, 324
Colorado.....	1, 172, 778	952, 239			
Florida.....			66, 796	120	
Idaho.....			276, 239	270, 036	
Montana.....			279, 944	3, 833	
Nevada.....	123				39, 422
New Mexico.....					9, 282, 160
Utah.....	2, 737, 274	2, 703, 755	277, 344	2, 937	
Wyoming.....	2, 328, 370	406, 003	989, 149	25, 293	
Total.....	6, 238, 545	4, 061 997	1, 889, 472	302, 219	9, 411, 906

Action required during the year on original filings under the mineral-leasing laws is indicated in the following table and shows an increase of 3,294, or 425 percent, in the number of reports rendered on such filings.

Applications under the mineral-leasing laws, fiscal year 1933

[Includes cases pending July 1, 1932]

Mineral	Prospecting permits		Leases	
	Received	Acted on	Received	Acted on
Oil and gas.....	3, 650	3, 578		
Coal.....	236	231	123	119
Phosphate.....			6	6
Sodium.....	17	17	2	2
Potassium.....	86	85	4	3
Sulphur.....	27	27		
	4, 016	3, 938	135	130

Pursuant to paragraphs 2 and 25 (k) of the Oil and Gas Regulations (47 L.D. 437), definitions of the "known geologic structure" of 22 producing oil and gas fields were prepared and promulgated during the year, as follows:

Definitions of "known geologic structure", fiscal year 1933

State	Field	Date promulgated	Acres
California.....	Buena Vista Hills (revision).....	Feb. 14, 1933	29, 123
	Kern River (revision).....	Feb. 28, 1933	11, 772
	Kern Front.....	do	4, 640
	West Kern Front.....	do	1, 400
	Mount Poso.....	do	2, 800
	Round Mountain.....	do	3, 951
	Dominion.....	do	680
	Dorsey.....	do	360
Colorado.....	Thornberg.....	July 1, 1932	1, 738
	Hiawatha.....	July 6, 1932	3, 691
	West Hiawatha.....	do	1, 757
	Piceance Creek.....	do	11, 431
Montana.....	Cut Bank.....	Mar. 15, 1933	76, 351
New Mexico.....	Bloomfield.....	Dec. 2, 1932	4, 520
Utah.....	Kutz Canyon.....	do	3, 956
	Harley.....	May 29, 1933	1, 323
Wyoming.....	Hiawatha.....	July 6, 1932	926
	Garland (revision).....	Nov. 2, 1932	6, 780
	Byron (revision).....	do	3, 841
	Badger Basin.....	Nov. 3, 1932	4, 400
	West Mule Creek.....	Nov. 26, 1932	1, 404
	Bison Basin.....	Dec. 2, 1932	440
	Salt Creek (revision).....	Jan. 12, 1933	26, 919

The aggregate area of outstanding definitions of the "known geologic structure" of producing oil and gas fields on June 30, 1933, was 944,951 acres in California, Colorado, Montana, New Mexico, Oklahoma, Utah, and Wyoming.

POWER DIVISION

The work of power classification consists primarily in obtaining and making available for use in the administration of the public-land laws information as to the water-power resources of the public lands. The extent of this task is indicated by the fact that areas aggregating nearly 7,000,000 acres are now included in power reserves whose use will be required for the development of about 15,000,000 continuous horsepower. The field projects undertaken during the year are included in the preceding summary of field operations by States.

River surveys to the aggregate length of 250 miles were made of the White and Hood Rivers, Oreg., and the North and Middle Forks of Nooksack River, Wells Creek, and Glacier Creek, tributary to North Fork of Nooksack River, Queets River, and Clearwater River, Wash. Geologic examinations were made at two dam sites in Oregon. The depth to bedrock was investigated at 2 dam sites in Washington and 3 in Oregon. Five dam sites and three reservoir sites were surveyed in Washington.

Administration of the field supervision of power projects for the Federal Power Commission is carried on in this office. Investigations and reports have been made on 10 projects, construction and operation are supervised on 129 projects, and cost accounting is being supervised on 8 projects.

Pursuant to instructions of the Secretary of the Interior, dated August 24, 1916 (45 L.D. 326), reports were obtained on field inspections of 24 power projects under permit from the Interior Department and permittees under the act of February 15, 1901 (31 Stat. 790), and grantees under the act of March 4, 1911 (36 Stat. 1253), were called upon for detailed reports of the operation or development of their power systems during the calendar year 1932. The total installation of the reporting companies is 3,540,000 horsepower, of which 2,407,000 horsepower is at hydraulic plants and 1,133,000 horsepower at fuel plants. The total energy generated was 7,150,000,000 kilowatt-hours, which was 546,000,000 kilowatt-hours less than in 1931 and was the smallest output since 1925. The energy generated by water power increased 1,214,000,000 kilowatt-hours, or nearly 23 percent; and that generated by fuel decreased 1,760,000,000 kilowatt-hours, or nearly 74 percent. The changes from year to year in the percentages of the total power generated by water and by fuels are due principally to changes in run-off in wet or dry years.

AGRICULTURAL DIVISION

The principal functions of the agricultural division consist of the classification of lands as to irrigability, timber character, grazing value, and capacity for crop production under the enlarged and stock-raising homestead laws and the Nevada ground-water reclamation law; the preparation of reports on irrigation projects that require some form of Federal approval in connection with the administration of public-land laws; the initiation of withdrawals of land for reservoir sites and for public watering places; and the preparation of reports showing the agricultural utility of lands in important public-land regions, including a classification of the grazing lands as to forage types and yields and suggestions as to the proper use thereof to maintain a natural ground cover, prevent waste of the forage growth by overgrazing, and incidentally eliminate avoidable erosion losses, especially in grazing districts on the public domain.

Classifications are based on the results of field examinations by members of the division and on information obtained from other sources. The work is planned with the primary purpose of acting on pending applications for classification under the above-mentioned laws and of providing in advance the basis for appropriate action on new applications. There was a decrease of nearly 34 percent in the number received, and the arrearage was nearly 41 percent less at the end of the year than at the end of the fiscal year 1932. Substantially all of the decrease was in applications under the enlarged and stock-raising homestead laws.

Public Water Reserve No. 107, of April 17, 1926, embraces all vacant, unreserved public land that contains a spring or water hole needed or used for public purposes. This order requires a determination with respect to all entries of public land whether any of the subdivisions involved are affected by it. On the basis of such determination, orders of interpretation are issued from time to time, listing by legal subdivisions of the public-land survey any tracts found to contain a water supply affected by the order. New public-water reserves covering lands along streams and for special public purposes are also made from time to time.

In the field, broad areal studies were completed in northeastern Nevada. Intensive grazing studies were continued in Mono Lake and Owens Valleys, Calif., in connection with the administration of lands withdrawn under the act of March 4, 1931 (46 Stat. 1530). A land-classification report and map was completed for western Colorado, showing irrigated and dry-farming land, together with different range types and a summary of the aggregate forage resources as compared with the livestock population.

During the fiscal year the area designated under the Nevada ground-water reclamation act was increased 14,160 acres, to a total of 1,720,695 acres. Outstanding withdrawals under the act of October 2, 1888 (25 Stat. 527), on the basis of a selection by the Director of the Geological Survey, aggregating 61,397 acres, remained unchanged. Other results of the division's work are tabulated in the summaries of enlarged and stock-raising homestead designations and the general summary of cases.

MINING, AND OIL AND GAS LEASING DIVISIONS

The work of the mining and oil- and gas-leasing divisions is supervisory (both inspectional and regulatory) with respect to operations on the public domain for the discovery and development of petroleum, natural gas, oil shale, coal, phosphate, sodium, potassium, and sulphur; on certain land grants for gold, silver, and mercury; on naval petroleum reserves for petroleum and natural gas; and for all minerals on tribal and restricted allotted Indian lands subject to lease.

During the fiscal year there were 251 leases, licenses, and prospecting permits issued covering 241,843.14 acres. The number was less by 28 and the area less by 83,387.14 acres than in the preceding year. Cancellations, relinquishments, and expirations numbered 183 for 1933, compared with 180 for 1932.

Leases, licenses, and permits issued, fiscal year 1933

	Num- ber	Acres		Num- ber	Acres
Licenses: Coal.....	32	1,360.25	Permits:		
Leases:			Coal.....	84	48,175.03
Coal.....	35	3,316.13	Potash.....	78	161,724.78
Potash.....	3	8,478.71	Sodium.....	14	15,665.34
Phosphate.....	4	2,482.90		176	225,565.15
Sodium.....	1	640.00			
	43	14,917.74	Grand total.....	251	241,843.14

There were 951 mining leases, licenses, and permits involving 838,025.49 acres of public land that were under supervision at the end of the year, an increase over the previous year of 68 leases, licenses, and permits and of 72,962.95 acres.

Prospect wells numbering 29 and drilled to a total depth of 21,472 feet, were supervised during the year, as compared to 39 wells, with a total depth of 29,931 feet, during the preceding year. The number of operating mines was greater by 69 than in 1932. Production of coal was less by 28,945 tons than in 1932. The number of coal mines increased from 432 to 498, or 15.3 percent. The value of the coal produced was \$6,156,200, a decrease of \$366,104. The condition of the wagon mines has shown continued improvement. More

orderly mining plans have increased the life of mines and reduced the cost of mining.

The value of phosphate mined on public lands was \$5,203.66, a decrease of \$100,602.34 over 1932. Production decreased 31,455.99 tons. In Montana, a 1,300-foot crosscut tunnel, started last year to intersect the phosphate rock on a Government lease, was completed, and the initial shipment of phosphate rock was made.

From the potash leases there were produced and sold sodium salts valued at \$533,324.85 and potash valued at \$1,023,232.05. The production of potash increased 127,596.38 tons. During the year drilling was done on 20 test holes for potash in New Mexico to a total depth of 15,706 feet, and in Utah 1 hole was deepened 1,495 feet. Two mine shafts in New Mexico were started during the year. One was completed at a depth of 1,000 feet and the other sunk to a depth of 250 feet. The capacity of the New Mexico potash mines will be ample to meet the American demand for potassium muriates for many years. The accident rate of the United States Potash Co. was reduced 82 percent.

Active prospecting for sodium borates was conducted in the Kramer district in California by a geophysical survey of about 2 square miles and by 3 test holes completed and 1 partly completed; total depth of tests, 4,703 feet. Prospecting for anhydrous sodium sulphate was continued in the Verde Valley, Ariz.

Twenty-five applications for sulphur prospecting permits in New Mexico involving about 15,308 acres, have been received, but no permits have yet been issued.

MINING OPERATIONS ON INDIAN LANDS

The greater part of the mining on Indian lands is in Oklahoma, where there are zinc and lead mines on restricted Quapaw land; coal mines on segregated Choctaw and Chickasaw coal and asphalt lands and on restricted Indian coal lands; and scattered deposits of volcanic ash, building stone, gravel, lead, zinc, and other minerals of less value on other Indian lands. The Geological Survey functions as an agent for the Indian Service in the engineering phases of supervision over these operations.

OIL AND GAS OPERATIONS ON PUBLIC LAND

Engineering and geologic details were completed and departmental approval obtained for the cooperative or unit plan of development of the Pitchfork oil field, Wyoming, pursuant to the act of March 4, 1931 (46 Stat. 1523), amending the Mineral Leasing Act of February 25, 1920. Detailed consideration was given to a proposed

unit plan of development of the Middle dome, Kettleman Hills oil and gas field, California.

Investigations were made regarding the matter of computing Government royalty oil on the basis of 100-percent volume measurement, and engineering reports were submitted to the department. On the basis of reports made by the Geological Survey, the Department September 10, 1932, modified the minimum price requirements for royalty settlements on crude oil produced in the Oregon Basin field. Studies were made in the matter of computing reduction of royalties on crude oil authorized under section 17 of the Mineral Leasing Act of February 25, 1920 (41 Stat. 437), and of allowances to cover the cost of treating emulsified oils.

Oil and gas leases and permits on the public domain

State	Received during fiscal year 1933				Under supervision of the Geological Survey June 30, 1933					
	Leases		Permits		Leases		Permits		Suspended preference rights to leases	
	Number	Acres	Number	Acres	Number	Acres	Number	Acres		
Alaska.....			8	18,250.24			91	184,602.63		
Arizona.....			6	12,483.88			68	161,389.62		
Arkansas.....							15	23,502.60		
California.....	6	1,081.61	159	117,739.05	198	52,740.48	568	447,289.41	5	3,526.21
Colorado.....	1	640.60	82	118,946.80	25	18,953.37	428	754,472.73	3	5,610.82
Idaho.....			12	20,807.06			71	134,904.77		
Louisiana.....					10	770.82	1	40.00		
Montana.....	3	716.23	159	158,473.87	77	15,995.17	551	545,618.36	1	1,358.82
Nebraska.....			1	280.00			1	280.00		
Nevada.....			5	12,671.27			51	122,861.74		
New Mexico.....	8	5,204.75	243	453,114.94	68	44,532.06	1,054	2,230,767.14	24	40,099.03
North Dakota.....			8	2,201.29			19	22,913.70		
Oklahoma.....			8	3,220.91	17	730.20	13	4,902.91		
Oregon.....			9	14,253.46			24	45,932.92		
South Dakota.....			12	10,922.66			25	25,966.42		
Utah.....			48	65,387.33	11	3,740.74	513	1,059,333.58	2	3,720.00
Washington.....			5	8,690.46			5	8,690.46		
Wyoming.....	5	3,440.00	239	386,116.63	402	120,600.52	945	1,609,037.53	16	15,507.40
Total.....	23	11,083.19	1,004	1,403,559.85	808	258,063.36	4,443	7,382,506.52	51	69,822.28

WORK ON PUBLICATIONS

Geological editing and drafting of maps and illustrations.—The geologic map of the United States, scale 1:2,500,000, was read in plate proof and color proof, and the printing was directed by the editor. The map was published during the year.

The final drawing of the geologic map of Colorado was begun and about a quarter of the map was drawn. The compilation of the geologic map of Montana in cooperation with the State Bureau of Mines was well advanced. The Somerset-Windbar (Pa.), Montevallo-Columbiana (Ala.), and Hollidaysburg-Huntingdon (Pa.) folios are in hand, and a little progress on them was made during the year.

The geologic map of the Valley of Virginia, scale 1:250,000, prepared in cooperation with the Virginia Geological Survey, was edited, engraved, and read in color proof, and printing was begun. The map of the Tennessee Basin, showing mineral resources, scale 1:500,000, compiled in the fuel section, was drawn for photoengraving, and color proof was read; the map was approved for printing.

DISTRIBUTION

A total of 331 publications, comprising 82 new books and pamphlets (including 29 guidebooks for the excursions of the International Geological Congress), 99 new or revised topographic and other maps, 1 geologic folio, and 149 reprinted topographic and other maps, were received by the division of distribution during the year. A number of special pamphlets and forms for administrative use were also delivered and distributed. The total units of all publications received numbered 148,553 books and pamphlets, 3,776 geologic folios, and 660,456 topographic and other maps, a grand total of 812,785.

The division distributed 109,511 books and pamphlets, 4,285 geologic folios, and 599,108 maps, a grand total of 712,904, of which 3,187 folios and 477,867 maps were sold. The sum received for publications and deposited in the Treasury was \$29,969.12, including \$29,372.52 for topographic and geologic maps and \$596.60 for geologic folios. In addition, \$1,640.85 was repaid by other establishments of the Federal Government at whose request maps or folios were furnished. The total receipts, therefore, were \$31,609.97.

DIVISION OF ENGRAVING AND PRINTING

During the fiscal year 90 newly engraved topographic maps were printed, including 2 revised maps, and 8 new maps were photolithographed and printed, making a total of 98 new maps printed and delivered. Corrections were engraved on the plates of 133 maps. Reprint editions of 149 engraved topographic maps and 10 photolithographed State and other maps were printed and delivered. In addition, 44 new topographic maps had been engraved and were in press June 30, and the engraving of 30 other new topographic maps was nearly completed. Of new and reprinted maps, 257 different editions, amounting to 659,429 copies, were delivered. One new geologic folio was printed, its edition amounting to 3,776 copies. The geologic map of the United States (4 sheets), scale 1:2,500,000, was printed, its edition (first printing) amounting to 1,087 copies.

A large amount of work was done for 47 other units of the Government and 11 State governments, including many reprints, and the charges for it amounted to about \$138,000, for which the appropriation for engraving and printing geologic and topographic maps was reimbursed.

The output of the photographic laboratory consisted of 14,744 negatives (including 4,483 wet plates for photolithographs, 900 wet plates for photographic prints, 13 paper negatives, 2,683 dry plates, 555 lantern slides, and 6,110 field negatives developed), 27,824 prints (including 2,548 maps and diagrams, 24,628 photographs for illustrations and records, and 648 bromide enlargements), 3,944 zinc plates, 320 intaglio etchings, 19 celluloid prints, and 13,238 prints mounted.

LIBRARY

The outstanding feature of the year in the library was the acquisition, through the friendly intercession of Mr. Walter E. Reid, of the great collection of works on precious stones, gems, and jewels assembled by the late George Frederick Kunz, of New York City, who for many years was associated with the Geological Survey. This acquisition was made possible through the generosity of Mrs. Opal Logan Kunz, of New York City, and Mrs. Hans Zinsser, of Boston, to whom the library was bequeathed by Dr. Kunz. The collection is by far the most comprehensive in the world on this subject. The accessions during the year comprised 11,197 books, pamphlets and periodicals, and 1,091 maps.

Amounts appropriated for, transferred to, and expended by the United States Geological Survey pertaining to the fiscal year ended June 30, 1933^a

	Funds available			Expenditure			Balance	
	Amount of appropriation	Repayments on account of work performed		Total	Disbursements	Outstanding liabilities		Total
		Made	To be made					
APPROPRIATIONS								
Salaries.....	\$143,750.00	\$7,246.34		\$150,936.34		\$150,938.36	\$57.98	
Topographic surveys.....	554,400.00	290,864.50	\$51,224.11	886,488.61	819,131.24	822,718.35	73,770.26	
Geologic surveys.....	373,750.00	41,342.87	7,613.77	422,706.64	407,397.63	409,129.30	13,577.34	
Fundamental research in geologic science.....	46,000.00	5,150.91		51,150.91	50,439.22	50,449.06	701.85	
Volcanologic surveys.....	17,250.00	3,000.00		20,250.00	20,175.67	2,200.38	49.62	
Alaskan mineral resources, 1933.....	9,000.00			9,000.00		9,000.00		
Alaskan mineral resources, 1932-33.....	60,000.00	9,046.91		69,046.91	57,437.40	59,112.50	9,934.41	
Gaging streams.....	675,000.00	239,158.72	74,134.99	988,293.71	950,913.56	960,907.68	27,386.03	
Classification of lands.....	190,000.00	197.42		190,197.42	181,447.26	183,465.73	6,731.69	
Printing and binding.....	138,000.00	11.82		138,011.82	68,876.90	94,882.55	43,129.27	
Preparation of illustrations.....	23,000.00	986.62		23,986.62	23,696.95	23,696.95	289.67	
Geologic and topographic maps.....	126,500.00	158,878.36	12,565.06	297,943.42	289,170.46	290,106.89	7,836.53	
Mineral leasing.....	258,750.00	403.11		259,153.11	249,692.17	250,352.69	8,800.42	
	^c 2,615,400.00	756,287.58	145,537.93	3,517,225.51	3,278,316.82	3,324,960.44	192,265.07	
TRANSFERS								
Alaska Railroad appropriated fund (act Feb. 14, 1931).....	^d 15,686.79	527.21		16,214.00	16,145.94	16,214.00		
Engineer operations in the field (War Department, act Feb. 14, 1931, 1931-Dec. 31, 1932).....	^d 173.28			173.28	173.28	173.28		
Federal Power Commission (act Apr. 22, 1932), 1933.....	800.00			800.00	561.48	561.48	238.52	
Field investigations of public health (Treasury Department, act Apr. 22, 1932), 1933.....	400.00			400.00	400.00	400.00		
Flood control, Mississippi River and tributaries (War Department act Feb. 14, 1931).....	^d 57,028.29	400.12		57,428.41	55,941.39	56,118.11	^e 1,310.30	
George Washington Bicentennial Commission (act May 21, 1920).....	^d 61.78			61.78	61.78	61.78		
Irrigation, Indian reservations (reimbursable, act Apr. 22, 1932), 1932-33.....	250.00			250.00	246.57	246.57	3.43	
Irrigation, San Carlos and Florence-Casa Grande projects, Arizona (reimbursable, act Apr. 22, 1932), 1932-33.....	2,750.00			2,750.00		2,750.00		
Maintenance and improvement of existing river and harbor works (War Department, act Feb. 14, 1931).....	^d 3,978.31		38.24	4,016.55	3,479.60	3,537.98	^e 478.57	
Maintenance and improvement of existing river and harbor works (War Department act Apr. 22, 1932).....	25,650.00	36.79	15.05	25,701.84	21,605.82	21,608.34	^e 4,093.50	
Maintenance irrigation system, Wapato project, Washington, act Aug. 1, 1914, special fund (act Apr. 22, 1932).....	575.00	8.00		583.00	582.30	582.30	.70	

Operation and conservation of naval petroleum reserves (Navy Department) (act Apr. 22, 1932), 1933.....	45,000.00	-----	-----	45,000.00	44,488.18	-----	44,488.18	511.82
Supervising mining operations on leased Indian lands (act Apr. 22, 1932), 1933.....	69,000.00	2,766.76	-----	71,766.76	70,459.18	12.49	70,471.67	1,295.09
Waterways treaty, United States and Great Britain (State Department, act July 1, 1932), 1933.....	55,700.00	2,286.09	-----	57,986.09	57,474.08	478.68	57,952.76	33.33
Grand total.....	2,892,453.45	762,312.55	145,591.22	3,800,357.22	3,552,686.42	47,440.47	3,600,126.89	200,230.33

^a In addition to these appropriations, there was an allotment of \$12,424.50 for miscellaneous supplies from the appropriation for contingent expenses of the Interior Department.

^b Of this balance \$40,000 unexpended due to limitation on printing and binding imposed by sec. 302, part II, of the Legislative Appropriation Act approved June 30, 1932.

^c Included in this total is \$284,400 transferred from the roads and trails appropriation of the National Park Service.

^d Balance unobligated on June 30, 1932, and continued available for expenditure in the fiscal year 1933.

^e Of the \$1,016.15 balance as of June 30, 1932, \$842.87 has been returned to the War Department.

^f Of the \$58,115.29 balance as of June 30, 1932, \$1,087 has been returned to the War Department.

^g These balances continue available for expenditure in the fiscal year 1934, subject to the approval of the War Department.

^h Of the \$11,292.24 balance as of June 30, 1932, \$7,313.93 has been returned to the War Department.

ⁱ Included in this amount is \$9,000 transferred from the roads and trails appropriation of the National Park Service.

^j Included in these amounts is \$200,496.12 covering work performed by Geological Survey units for other Geological Survey units; supplies furnished by one branch to another; credits to appropriations on account of impounded salaries which have been released; adjustment vouchers between transferred funds and Geological Survey appropriations; and other adjustments necessarily reported in combining totals but otherwise a duplication.

Classification of expenditures by the United States Geological Survey pertaining to the fiscal year ended June 30, 1933

Object of expenditure	Geological Survey salaries	Topographic surveys	Geologic surveys	Fundamental research	Volcanologic surveys	Alaskan mineral resources	Gaging streams	Classification of lands	Printing and binding	Preparation of illustrations	Geologic and topographic maps of the United States	Mineral leasing	Total
Personal services.....	\$150,133.36	\$676,567.24	\$381,355.21	\$47,993.00	\$18,772.92	\$85,747.94	\$775,571.20	\$154,494.98	-----	\$23,103.10	\$249,775.22	\$317,000.17	\$2,800,514.34
Stationery and office supplies.....	-----	2,995.03	598.82	160.79	19.56	275.28	9,803.26	299.69	-----	161.93	2,807.99	722.73	17,845.03
Scientific and educational supplies.....	-----	364.68	1,428.36	-----	13.25	89.31	1,218.42	98.15	-----	.92	4,267.87	571.60	8,052.56
Sundry supplies.....	-----	5,986.23	344.36	3.20	7.59	33.29	18,044.20	78.00	-----	.60	19,207.96	548.29	44,253.72
Subsistence and care of animals.....	-----	1,781.23	576.75	-----	-----	70.50	349.32	77.60	-----	-----	-----	106.31	2,961.71
and storage and care of vehicles.....	-----	509.26	106.44	-----	-----	4.36	780.18	58.32	-----	-----	2.68	340.91	1,802.15
Telegraph service.....	-----	212.25	104.25	-----	12.30	13.40	2,580.18	88.90	-----	-----	-----	1,942.18	4,853.46
Telephone service.....	-----	188.09	6.94	30.27	1.15	39.57	231.06	1.15	-----	-----	-----	103.69	601.92
Other communication service.....	-----	65,773.42	7,561.57	438.47	1,075.87	5,645.37	62,816.14	13,180.14	-----	-----	31.91	11,822.58	168,345.47
Travel expenses.....	-----	88.63	958.63	-----	-----	-----	391.31	-----	-----	-----	-----	95.11	1,533.63
Attendance at meetings.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Hire, maintenance, operation, repair of horse-drawn and motor-propelled passenger-carrying vehicles.....	-----	2,839.74	1,203.42	107.57	139.11	-----	30,409.32	4,501.30	-----	-----	-----	15,154.60	54,355.06
Transportation of things.....	-----	37,410.93	3,677.42	9.84	66.70	1,104.70	17,011.04	1,916.05	-----	-----	227.05	722.60	62,146.33
Printing and binding.....	-----	3.30	-----	-----	-----	-----	5.33	\$94,870.73	-----	-----	6,656.61	-----	101,535.97
Lithographing, engraving, and etching.....	-----	15,016.57	1,523.42	72.67	-----	718.16	1,274.09	664.35	-----	40.41	22.46	9.82	19,341.95
Stenographic work, typewriting, and duplicating work, etc. (job work).....	-----	348.03	43.74	8.87	-----	285.41	305.84	113.22	-----	3.12	-----	20.97	1,139.20
Photographing and making photographs and prints.....	-----	18,678.44	1,567.61	758.39	17.17	404.15	2,500.10	2,131.19	-----	96.15	-----	106.38	26,259.53
Heat, light, power, water, and electricity.....	-----	24.02	32.11	-----	-----	40.16	312.31	-----	-----	-----	-----	3,906.16	4,314.76
Rents.....	-----	466.27	1.56	-----	-----	4,797.23	4,797.23	.84	-----	-----	-----	2,929.10	8,195.00
Repairs and alterations.....	-----	305.41	96.19	-----	-----	12.30	3,952.73	12.10	-----	-----	618.08	1,227.71	6,224.52
Special and miscellaneous current expenses.....	-----	5.20	-----	-----	-----	37.45	85.07	-----	-----	-----	-----	185.56	313.28
Purchase of passenger-carrying vehicles.....	-----	583.86	-----	-----	-----	-----	7,752.43	1,126.40	-----	-----	-----	1,570.70	11,033.39
Furniture, furnishings, and fixtures.....	-----	483.64	27.64	-----	-----	-----	1,906.25	233.41	-----	-----	9.00	3,098.10	5,758.04
Educational and scientific equipment.....	-----	5,081.65	2,845.62	28.35	3.75	258.74	40,213.71	923.92	-----	15.36	3,855.57	519.71	53,746.38
Other materials and equipment.....	-----	12,321.44	521.48	-----	29.32	107.88	10,441.44	328.77	-----	-----	1,075.69	291.87	25,117.89

OFFICE OF EDUCATION

(GEORGE F. ZOOK, Commissioner)

Dr. William John Cooper, the eighth Commissioner of Education, terminated his period of service in the Office of Education on July 10, 1933, very soon after the closing of the year for which this annual report is prepared. It is therefore a report of the activities of the office under Dr. Cooper's administration.

EDUCATION DURING THE DEPRESSION

To a very great extent the whole program of study of the office has been modified by the present economic situation in the selection of problems, the program of service, the types of publications issued. It has been the serious intent to give prompt, specific, practical help in today's pressing problems.

While the effects of the depression were reflected in school budgets a year or so after they were felt by the industrial and commercial world, this past year has been a critical one for schools of all types and in all parts of the country. Budget reductions for the year averaged about 7 percent in city school systems and $5\frac{1}{2}$ percent in rural schools, representing a reduction of at least \$112,000,000 in current expenditures at a time when enrollments were still increasing rapidly. Budgets for capital outlay, such as new grounds, buildings, and equipment, were cut more than 40 percent. This means spending approximately \$108,000,000 less this year on school buildings, although there are still more than a quarter of a million children going to school on a part-time basis or being housed in portables. These reductions have been reflected in shorter school terms, the closing of many schools, larger classes, employment of about 14,000 fewer teachers this year than last, elimination of many school departments and services, and reduction in teachers' pay ranging from 5 percent to 50 percent or more. Along with these curtailments there has been evident a widespread spirit of criticism of the schools, their programs, and their officials which has expressed itself in demands for drastic cuts and changes.

To be of service to school officials, legislative committees, and laymen interested in education the Office of Education has carried on a series of investigations and issued publications of various types. They have been of three principal kinds:

1. *Investigations to discover what the situation is, how the schools are affected, and what they are doing.*—Of this type have been the four reports on the current situation in city schools, in rural schools, in colleges and universities, and in schools in foreign countries. These studies made early in the year are now being repeated as a retrospect of this year and a prognosis of next. Others have reported on what schools and colleges are doing for the unemployed, both of a relief and a rehabilitation nature. A series of legislative circulars have reported current legislation both completed and pending in Congress and in the State legislatures. The results of these studies have been issued as Office of Education publications, as news releases, and as periodical articles in order to give them widespread publicity.

2. *Investigations of desirable practices for effecting economies.*—School officials are having to act rapidly; they want information on what others are doing in similar circumstances, on how savings can be made without injuring the fundamental educational possibilities. For this purpose the staff has prepared a series of circulars on economies in school administration. They cover such topics as class and school organization, techniques for teaching large classes, correspondence courses for high schools, the elimination of very small schools, the better utilization of school buildings, the care and upkeep of the school plant, centralized purchasing and distribution of supplies, the use of adequate school accounting systems. In each case the report has consisted of reports on how these recommended economies have actually worked out in the city school systems.

3. *Investigations of school practices which have long-time permanent value and to which school officials and the general public should be looking forward.*—Schools will be slow to reconstruct. It is not their hope to build back to where they were but to build for the changing needs and conditions of the public which they serve. A continuous study of the desirable size of the unit for school administration paralleling similar ones of the desirable size of the civil administration unit is under way, parts of which have already been issued. Another problem requiring continuous study is that of the participation of the State and the Federal Government in the financing of education. How is it done? How does it work? How should it be done? These are questions which required continued investigation.

PUBLIC SCHOOL ADMINISTRATION

For many years authorities on school administration have been advocating a unit of school administration and support larger than the small district employing only a few teachers. A few years ago it became evident that the adequacy of the school administrative units provided throughout the country would not only be questioned further but would also be given a severe test with regard to their

ability to maintain good schools. Interest manifested in the various types of administrative units indicated that a study to supplement the recent one on "Administrative Units" was needed to show how economies may be and are being effected through larger units of administration and support. Such a study has been prepared by the office and is now in press, treating of several types of units larger than the small district common throughout the country.

Another study in the field of administration treats of systems of centralized purchasing and distribution of supplies. In many sections of the country supplies are purchased by each of the small school districts independently of one another. The study contains data showing the economies effected when small districts cooperate in the purchase of supplies.

The practice in certain cities of releasing public-school pupils during the school day to enroll in classes in religious instruction conducted by the churches was the subject of a study designed to answer these questions: How extensive is the practice of releasing public-school pupils for religious instruction? How is the plan administered? No attempt was made to evaluate the effectiveness of the plans.

Since the finances of the schools have been seriously affected within the past year or two, studies were made to show what the effect has been in regard to current expenses, teachers' salaries, capital outlay, length of school term, school building construction, size of classes, and services and activities. Additional studies showing the effect of decreased school support on the school are in progress and will be issued some time this fall.

EDUCATIONAL LEGISLATION

The past year has been particularly prolific of legislation affecting education. The Office of Education, while it has not been able to supply all the information requested, has been for more than a quarter of a century publishing reviews of educational legislation enacted within each biennium. Such a review was made of legislation enacted in 1931 and 1932 and published in Bulletin, 1933, No. 2. The review shows changes affecting State school administrative organization, State school support, local school administration, higher education, etc.

When the State legislatures are in session the office issues a series of circulars concerning legislative proposals and enactments affecting education in the various States. During the year four such circulars were issued, and others will follow to complete the summary of educational legislation enacted in 1933.

A study completed and in press treats of the legal and regulatory provisions affecting secondary education, including junior colleges.

This study deals with State and local administration of secondary education, and includes reviews of high school standards prescribed not only by State laws and by school administrative authorities but also those prescribed by regional accrediting associations.

Other studies completed in the field of school law include an analysis of the principal features of free textbook laws in the various States, with data on textbook adoption laws and textbook costs (Circular No. 60), and a summary and digest of statutory laws and judicial decisions pertaining to the releasing of pupils from public school for religious instruction (Pamphlet No. 39).

STATISTICS OF EDUCATION

One of the major responsibilities of the Office of Education is the collection and interpretation of statistics showing the condition and progress of education throughout the country. The program of collection, tabulation, interpretation, and publication of educational statistics has always been an extensive one and as education grows in numbers of persons concerned, and extent of investment the program of the office for this phase of service continues to grow.

It embraces two major aims and fields of service. The first one is that of reporting accurately and adequately the educational statistics for the Nation. This requires a continuous program of inquiry, tabulation, and reporting. The following table shows the fields of inquiry included in the past year's program and indicates to some extent the details which this collection of statistics must give to satisfy the requirements of adequacy.

TABLE 1.—*Review of statistical work, 1932-33*

Subject of study	Type of study ¹		
	Biennial	Periodic	Special
State school systems: Personnel and finances.....	C-T		
City school systems:			
Personnel and finances.....	C-T		
Per capita costs.....		C-T	
Effect of economic situation.....			C-T
Small school systems.....			T
Rural schools:			
Age-grade table for negro pupils.....			T
Libraries.....			T
Effect of economic situation.....			C-T
Higher education:			
Statistics of universities, colleges and professional schools.....	C-T		
Preliminary statistics 1931-32.....			T
Teachers colleges and normal schools.....			T
Background study of negro college students.....			T
Effect of economic situation.....			C-T
Expenditures in liberal arts colleges.....			T
Exceptional children:			
Residential schools for the blind.....		T	
Residential schools for the deaf.....		T	
Residential schools for delinquents.....		T	
Residential schools for mentally deficient and epileptic.....		T	
Residential and public schools and classes.....		C-T	

¹ C is collected; T is tabulated.

TABLE 1.—*Review of statistical work, 1932-33*—Continued

Subject of study	Type of study		
	Biennial	Periodic	Special
Elementary schools:			
Buildings.....			C-T
Case studies of pupils.....			C-T
Private schools.....			C-T
Part-time and continuation schools.....			C-T
Trade schools.....			C-T
Textbooks:			
Per capita cost of.....			T
Sales.....			C-T
Teaching staff: Physical care of teachers.....			C

These inquiries must be extensive in the completeness of the returns as well as in the coverage of types of education. To that end the statistical staff must be meticulous in securing as complete returns as is possible from as far-flung an educational system as is ours. A field staff of four assistant statisticians helps very greatly in securing complete returns, as is evidenced by the fact that during the past year they made more than 1,650 reports for schools which had not reported by mail.

The second major job is that of helping to improve methods of educational accounting throughout the country so that improvement in educational reporting is continuous. The Office of Education continues to assist in this work through the definitions established in its inquiry forms, through the details of its inquiry forms which indicate the items a good accounting system must include, and by the service rendered to State departments and other educational accounting offices by members of its staff.

NURSERY—KINDERGARTEN—PRIMARY EDUCATION

Reports of school budget cuts have challenged the generally accepted notion that kindergartens are an integral part of the elementary school. To show the status of kindergartens in cities of all sizes, a complete summary has been made of kindergarten enrollments, attendance, and numbers of teachers for the years 1930 and 1932. Effects of kindergarten opportunity upon the placement of children in the kindergarten-primary grades and of kindergarten attendance upon their promotion progress have also been indicated.

An experimental section of a long-term study of the promotion-progress of first grade children has been completed. General grade supervisors in 7 city school systems and 1 private school have cooperated in reporting for approximately 1,200 first-grade pupils, mental and chronological ages, promotions, scores on tests to detect tendencies to reversal in reading and to show reading achievement at the end of the school year. Interrelationships of these factors as related to the progress of first-grade children are being summarized.

ELEMENTARY CURRICULUM

Since interest in curriculum construction and materials continues throughout the country, the office has under way a series of publications designed to be helpful to curriculum committees and school superintendents in developing new courses of study. These publications will cover various phases of the elementary curriculum. One number of the series has been issued, "Safety Education—Helps for Schools in Constructing a Course of Study." During this year one other publication has been completed supplying materials for the development of curriculum material on conservation. Although this bulletin gives particular attention to problems of conservation in Alaska, it contains materials designed for the use of curriculum committees and teachers not only in Alaskan schools but also in the public elementary schools in general.

In addition to this series of elementary curriculum studies a number of service publications have been prepared, designed to give aid in problems of curriculum development. These include circulars listing Government materials in history, civics, and other social studies; an annotated list of recent city and State courses of study available for examination in the Office of Education; a circular detailing language activities for primary grades; and bibliographies on the elementary-school auditorium program and other phases of elementary-school work.

COLLEGIATE AND PROFESSIONAL EDUCATION

The self-criticism of institutions of higher education has increased markedly during recent years. This criticism has been accentuated by the financial depression. The public has begun to join in this to such a degree that now the criticism threatens to become destructive rather than helpful. Certain special studies carried on during the past year by the Office of Education have been designed to shed light on the questions at issue in these criticisms.

The following three are among the most important of these questions:

1. *What is the State's responsibility for higher education?*

Through its governmental machinery the State, as a political unit, creates its public institutions of higher education and provides for their control and support. Through its corporation laws, the State decides the terms under which private institutions shall be established and conducted. Each State would seem to be accountable, therefore, for the adequacy or inadequacy as well as for the economical administration of its entire program of higher education both public and private.

Three studies were completed during the past year bearing upon this question. One of them described the present status of higher education in 10 selected States as disclosed by the number, types, and location of institutions, the methods of their control, and their curricular offerings. The institutions listed included all public and private universities, colleges, technical institutes, teachers colleges, normal schools, and junior colleges so that a clear picture is obtainable of the State's higher educational facilities. The methods by which the State exercises control over its public institutions, the sources of financial support from the State, and the powers of the State budgetary agencies in determining the funds furnished to the institutions were described. For the private institutions were presented the legal provisions under which they obtained their charters, together with the jurisdiction retained over them by the State after their incorporation, and the particular organizations controlling them, whether religious or nonreligious. The curricular offerings of each institution were shown in tabular form so that it was possible to ascertain the number of institutions offering the same curricula. The 10 States represented were: Colorado, Indiana, Kansas, Michigan, Oklahoma, South Carolina, South Dakota, Texas, Virginia, and Washington.

The second study dealt with the growing tendency to unify the control of all State-supported institutions in a given State under a single board and a single executive officer. The historical development of higher education in the several States shows in general that as diverse types of higher education were needed new institutions were created by the States with little reference to those already in existence. A practice of creating a new governing board for each institution prevailed generally. The final result was that there was a multiplicity of governing boards each devoting itself to the advancement of the interests of its particular institution rather than for a State-wide coordinated and integrated system of higher education. Because of this situation a trend toward unified control developed, and central governing boards for all institutions supplanting individual boards for each institution. This movement for centralized control was described for 13 States where such coordination has been most completely achieved. The States considered were: Florida, Georgia, Idaho, Iowa, Kansas, Mississippi, Montana, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, and West Virginia.

The third study presented statistical data for use in answering in part many questions such as the extent to which higher education is regarded as a function to be supported and controlled by the public; the effectiveness of the appeal of the institutions within a

State to the young people of that State; and the percentages of young people who carry their education to the college level.

Because of a lack of funds available for printing in the Office of Education these three studies were published by the Carnegie Foundation for the Advancement of Teaching, New York City, under the title, "The State and Higher Education."

2. *Can institutions of higher education be maintained on smaller budgets without serious loss of efficiency?*

With heavy reductions in their annual income due to the financial depression, both publicly and privately supported institutions of higher education have been compelled to adopt radical programs of retrenchment. The problem confronting them has been and still is one of making internal fiscal adjustments with a minimum impairment of the educational efficiency of the institution.

In conjunction with Dr. David S. Hill, staff associate of the Carnegie Foundation for the Advancement of Teaching, a study was made of the most practical methods of economizing in higher education. This study was devoted not only to the general principles to be utilized in reducing expenditures but also to specific means which have been found most serviceable in effecting retrenchments. It contains suggestions and proposals for economies in administration, courses and curricula, instructional practices, research, maintenance and operation of physical plants, and business management. The Carnegie Foundation for the Advancement of Teaching published this study.

Another study (published in the Bulletin of the Association of American Colleges) dealt with the grouping of institutions according to type of control and size of student body. This gave certain basic statistical data bearing upon the question of the relative unit costs of small colleges and large colleges.

A third study (mimeographed) dealt with the 1932-33 salaries of college faculty members in institutions classified according to types. Distribution of salaries by ranks and the percentage of decreases from the previous year were tabulated. These two bodies of data make it possible for any institution to compare its salary schedule and its salary decreases with those of comparable institutions.

A fourth study (published in the Educational Record) dealt with certain specific effects which the depression was having upon the colleges and universities during the passing months. A limited number of institutions were addressed, the main data having been assembled from the current literature. Reductions in appropriations, in student fees, and in income from endowments were reported, as were instances of unfavorable legislation.

A fifth study (rotoprinted) dealt with the effects of the economic depression on the fiscal affairs of the institutions of higher education

for the year 1932-33 as compared with 1931-32. Data were collected in this study showing the percentages of decrease in tuition fees, receipts from public sources, educational and total expenditures, and salaries for the various ranks of faculty members.

3. *Are colleges and universities tending to expand their offerings unduly?*

Recent decades have witnessed great expansion of programs in many colleges and universities. No adequate distinction has been made among the objectives and standards which should prevail at the different levels. This expansion is having the most marked effect at present in the graduate field. Many universities are adding curricula leading to advanced degrees. The cost of equipment and staff necessary to carry these advanced courses and research is very great. Two studies have been undertaken to shed light on this question. One on the subject of objectives of graduate education has been done in cooperation with Dean Thompson, of Howard University, and the other, nearing completion, deals with general standards and practices now prevailing in graduate schools.

Two other special studies have been made: Because of the growing interest in student personnel activities, a study was made of the functions performed by deans of men; one additional leaflet (home economics) was completed for the series of guidance leaflets.

EDUCATION OF SPECIAL GROUPS

Recent developments, world-wide as well as domestic, concerned with the education of *native and minority groups* have disclosed more fully the significance of old problems as well as revealed new ones—new at least in the sense that they have not heretofore been generally recognized and understood. A comprehensive, selected bibliography on the education of native and minority groups has been prepared with special reference to the education of groups under the jurisdiction of the United States. It would, however, be incomplete did it not include also, as it does, references on educational undertakings in progress in territories governed by foreign countries whose experience has extended over a longer period of years than ours, as well as those which help the student to acquire a general background of information and understanding of racial traits, abilities, environmental influences, and the like, which underlie successful theory and practice in education.

Another study, completed after a period of 2 years' inquiry, of the intelligence, social traits, and environmental resources and influences of the natives of Alaska has been made available during the year. It was planned to offer a scientific basis for reorganization of the schools for the natives of Alaska, particularly those phases of education which are concerned with curricular adaptation.

A manuscript completed this year and now being printed deals with the education of bilingual children and is a result of more than a year's study of the education of Spanish-speaking children in our Southwestern States. Such children attend our public schools in large numbers, where because of language difficulties, foreign customs, and tendency to live in isolated communities, numerous and often serious problems arise concerned with their attendance and satisfactory progress. This study shows conditions, summarizes progress in research and experimentation pertinent to the problems involved, and gives practical suggestions for improving teaching materials and practices.

A study of the present status of the education of migratory children has been made, chiefly for the purpose of keeping in touch with recent developments and maintaining our informational service. It supplements studies reported in the White House conference publications.

A study of general conditions and educational facilities in the Southern Appalachian Mountain regions, extending over a period of about 2 years and made in cooperation with the Department of Agriculture, has opened up problems for continued study. This pioneer effort to consider underlying relationships of social and economic conditions and popular attitudes to the provision and utilization of schools should be of value in guiding future procedures in other backward regions as well as the one directly under investigation.

EDUCATION OF EXCEPTIONAL CHILDREN

The aim of the Office of Education is to build up a comprehensive well-balanced program providing service for all types of exceptional children and for all phases of the problems involved in their education.

All studies and publications have been directed toward the realization of practical service to administrators, teachers, and parents. State administration is represented by a study of organization for exceptional children within State departments of education. A manuscript giving its findings is now in press. City administrative practices are involved in the published study of Adjustment of Behavior Problems of School Children, which describes and evaluates the clinical program set up within a given city school system. This investigation represents a cooperative project of the Office of Education and city school administrators. A second project of cooperative type is now under way in association with another city.

Teachers' problems with exceptional children have received consideration from two points of view. First, a series of pamphlets is in preparation dealing with practical classroom problems met by teachers in rural and small urban districts where little special help is available. Two of these are in press, one dealing with blind and partially seeing, the other with gifted children. The series is planned

to include a pamphlet for each of the remaining six major groups of exceptional children. The second study for teachers describes group activities for mentally retarded pupils. It is a compilation of activity units and projects contributed by successful special classroom teachers throughout the country. A similar compilation of instructional activities for gifted pupils is planned for the coming year.

Fundamental to a sound policy of service is a knowledge of conditions as they are. Statistics of special schools and classes are therefore indispensable in the scheme of work. During the past year statistical surveys have been made of four types of residential schools: For the blind, the deaf, the mentally deficient, and the delinquent. The results appeared in mimeographed circulars and will be summarized in the printed biennial survey of education for the period 1930-32. An extensive statistical study was also made of day schools and classes for exceptional children in city school systems, the results of which will appear in the biennial survey.

EDUCATION OF NEGROES

Service to the education of Negroes has centered during the year in the completion of two large projects carried on as part of the National Surveys of Secondary Education and of Teacher Education made by the Office of Education. Special studies of secondary education among Negroes and of the education of Negro teachers were made as integral parts of the respective surveys. Each is being issued as a separate monograph of the respective series. Two other comprehensive studies were undertaken during the year, one on education of Negro children in schools under the Jeanes supervisors in certain representative rural districts of the South; the other a background study of Negro college students. All four of these were completed during the year and are now in press.

Another study under way investigates the availability and accessibility of schools and the quality of education furnished to Negro children in rural communities. This is an intensive study of educational conditions in representative counties in six States, selected as reasonably typical of social and economic situations among Negroes in the South. The State supervisors of Negro schools and the county superintendents in the respective States cooperated with the office in the collection of the necessary information. This study, while undertaken in part as the result of experience and of demands made on the office for information concerning the problems under consideration, was inspired in part also by the findings of the four studies mentioned above.

The findings of these studies in the elementary school field add evidence to the lack of availability of schools to Negroes; inadequacy in the quantity and quality of education offered in terms of curricula,

equipment, term length, modern methods and procedures; inadequacy of the training of teachers; disparities between educational opportunities for children in rural as compared with those in other localities; disproportion between the salaries of Negro and white teachers; lack of relationship between the teacher-education programs of Negro colleges and the practical needs of the schools.

SCHOOL HYGIENE, PHYSICAL EDUCATION AND RECREATION

Those responsible for conditions which may influence the safety and health of the child are interested in learning the shortcomings of their own school. To this end the office has prepared a self-survey form, consisting of a series of questions covering the matters of fire prevention and escape, general housekeeping, air conditioning, lighting, seating, water supply, toilets, playgrounds, lunches, mental conditions, instruction in hygiene, bodily conditions of the child, personnel and health of the teacher. If the questions can be answered in the affirmative the school is, according to our present knowledge in this field, doing what it should. Requests for this survey form have necessitated repeated editions.

While health education has been loudly proclaimed as the most important obligation of our schools, health instruction in grades IX to XII has been very much neglected. This fact is pointed out in a publication which also attempts to furnish assistance to those desiring to meet the health educational needs of the students in these important years of their public schooling (pamphlet no. 43).

In 1926 this office made a thoroughgoing study of the health of the teacher, and what was being done about it. This year we have supplemented this work by an investigation of what schools in cities of 5,000 population and over are now doing to preserve and promote the welfare of teachers and other employees by way of health examinations, the granting of sick leave and sabbatical leave, etc.

GUIDANCE AND INDUSTRIAL EDUCATION

For the purpose of aiding in the development of school programs having for their aim the educational and vocational guidance of youth and the training of the individual for occupational employment, the office conducts investigations and renders informational and advisory services in the fields of guidance and industrial education.

During the past year a study was completed and issued as a publication of this office, describing in detail the various State programs. The study, made in cooperation with the National Committee on State Guidance Programs, a standing committee of the National Vocational Guidance Association, includes information relative to the administrative organization of guidance in State departments of edu-

cation and the guidance services rendered by them to the public schools of their respective States in organizing guidance programs.

A mimeographed report of the States' progress in guidance work during the past year was prepared for distribution at the meeting of the National Vocational Guidance Association and a summary published in the *Industrial Education* magazine.

Continuation schools, which are primarily part-time schools for pupils who early leave school to go to work, are at the present time affected by unemployment conditions. In some places there has been a decrease in enrollments, in other places there has been a modification of the program to include other types of classes. In order to obtain information as to the work carried on by these types of schools, a study was made of 206 part-time and continuation schools throughout the country. Information was compiled on enrollments, teachers, types of classes, subjects of instruction, and the report printed for distribution.

Renewed interest in technical schools and classes has been manifested during the past few years. At the present time questions growing out of the unemployment situation are being raised relative to provisions for training in both technical and trade subjects. To meet requests for information in these phases of education, a study was made of 160 technical and trade schools relative to subjects of instruction included day and evening classes, length of term, library facilities, etc. The manuscript for this study is in press.

EDUCATIONAL MEASUREMENT

A good barometer of the state of the scientific attitude in the school system is the extent to which tests and measurements are used. To encourage the more accurate methods of evaluation and direction of education, certain studies in the test and measurements field have been undertaken during this last year. For example, State departments have need for information at this time regarding the experience of others in carrying on cooperative testing programs. To satisfy this need a survey of the existing cooperative testing programs, both State and national, has been made. The good points of the programs have been summarized and suggestions for their improvement made. The survey is now available as a bulletin of the Office of Education.

A second major problem which has received attention is that of the admission of students to college. The problem of the use of tests in admitting college students is pressing at the present time because of the tendency, just beginning, to disregard the marks and units obtained in high school in considering college entrance. An intensive study of this problem is under way. Other studies of the use of tests for the guidance of college students both on entering and during their

college course are under way in cooperation with authorities in several colleges in order to extend the technique which has been developed. The results of the first of these cooperative studies will be published early this fall.

The third series of problems has to do with the use of tests and test results in the administration of various aspects of the school system. A study of the school life expectancy of failures in the elementary grades has been published in the *American School Board Journal*. Another of the methods of applying research techniques to radio experimentation has recently been published in the *Junior-Senior Clearing House*.

SCHOOL BUILDING PROBLEMS

During the past year, the phases of the work in the school building field that have been particularly stressed to have been (1) the techniques of educational planning with relation both to new buildings and existing buildings, (2) methods of utilizing existing plants so as to secure greater capacity, and (3) the importance of long-range school building planning in the present emergency.

The summary of the study on the *Functional Planning of Elementary School Buildings* has been of particular significance to school superintendents at this time of economic stress because of the suggestions it contains for constructive economies not only in the planning of new buildings but in the use of existing buildings.

Although school building construction decreased approximately 40 percent from 1930 to 1932, there has been a greatly increased school enrollment during the same period. In order that the experience during the World War may not be repeated—that is, too long postponement of school building—followed by a sudden orgy of school-house construction with no scientific study of needs, the Office of Education, in cooperation with the National Advisory Council on School Building Problems, is now undertaking a study, on a national scale and with a long-range view, of present school building needs and estimated school building needs over a 5-year period so that future needs may be met on the basis of scientific, long-range planning.

ADULT AND PARENT EDUCATION

Two major studies have been conducted in this field during the past year. One of these reports in detail the progress of adult education under public auspices in this country. It includes the report of the programs of State departments of education and of city school systems, vocational education for adults under State and Federal auspices, civilian rehabilitation, extension work as carried on by colleges and universities, the work of various opportunity schools, educational

programs for State prisons, illiteracy and its relation to adult education, and the contribution of the public libraries to adult education.

The second study is a continuous one on programs of parent education. The parent education work of the Office of Education was instituted at the request of organizations of parents for service to meet their particular educational needs. Materials and methods for parents' discussion groups have been reported from time to time and accounts given describing the methods and results of various parent education projects. As part of the cumulative study of the methods and practices of the various agencies carrying on the programs and projects in parent education, several sectional reports have been made during the year relating to parent education activities of universities and colleges, of State boards of health, of State departments of education, and of various religious organizations which have continuing programs.

PREPARATION OF TEACHERS AND OTHER STAFF MEMBERS

Within the past few years the major work of the office in this field has been the National Survey on Teacher Preparation. However, several studies other than those prepared by the survey staff have been published. One, a manuscript on the preparation of junior high school teachers, treats not only of the actual scholastic and professional preparation and experience of junior high school teachers, but of the adequacy of their training for the work they are to do, as shown by the number of subjects they are required to teach, the number of classes, the number of distinct preparations, the number and character of the subject combinations taught, and other pertinent topics.

Another publication issued during the year is a status study of the elementary school principalship. Data are presented showing the preparation of elementary school principals in cities of various sizes and in the open country, how much experience they have had, what their salaries are, etc.

COMPARATIVE EDUCATION

Studies of educational affairs of importance in foreign countries have a double value other than their news value. They depict growth toward the fairly common objectives in education and they offer much of value to educators in this country in the way of suggestions for improvement of our own educational systems and endeavors. The office regularly undertakes studies of important educational movements in other countries, attempting to bring out these two values. During the past year, with the help of the Department of State, an inquiry was made into the effects of the economic depression on education in other countries. The returns from the inquiry and data from other official sources were sifted and organized and will be published as Bulletin, 1933, No. 14.

A second type of study undertaken by the office in this field may be illustrated by the investigation of institutions of higher education in Norway. This summarizes for practical purposes the requirements of institutions in Norway, the credentials issued, and gives an indication of the method by which such credentials may be evaluated in this country for entering students. A similar study of institutions of higher education in Denmark is in progress.

Circulars on the chief education offices in the various countries of the world, and the certificates issued by the Scottish Education Department were revised and brought up to date. An inquiry into the literature on higher education in foreign countries, its history and present status, resulted in a bibliography of material relating to that subject.

VISUAL EDUCATION AND EDUCATION BY RADIO

In recognition of the present and potential uses of radio, talking pictures, and other sight and sound aids in education, the Office of Education (1) maintains an informational service; (2) initiates and cooperates in national and State projects and investigations; and (3) participates in the study of international and governmental problems pertaining to these fields. The widespread and rapid developments in these comparatively new and interesting fields require co-operative endeavor among broadcasters, motion-picture producers, sound-recording producers, and educators in the utilization of these marvels of science for the happiness and well-being of the American people.

Informational service.—The Office of Education collects, evaluates, compiles, and disseminates information about the present uses of radio, motion pictures, and sound recordings in education. During the past year a Government bulletin entitled "The Art of Teaching by Radio", a circular entitled "College Courses in Radio", and several articles and releases, have been issued to assist in the dissemination of the information that has been collected and to stimulate the use of available broadcasts and films.

National and State projects and investigations.—During the past year this office has been cooperating with the American Home Economics Association in a study of home economics broadcast series; with the National Committee on Education by Radio and the United States Department of Agriculture in a survey of the radio activities of land-grant colleges; with the National Advisory Council on Radio in Education in studying the use of radio by voluntary organizations and in stimulating interest in the council's broadcasts; to a lesser extent with the Payne fund in its motion picture appreciation experiment; and with other national, State, and local groups.

THE NATIONAL SURVEYS OF EDUCATION

The National Survey of Secondary Education, begun on July 1, 1929, had completed the first two stages by June 30, 1932, and had progressed well into publication at that time. The year just closing has witnessed accomplishment of the major portion of editorial work and actual printing as well as the beginning of the fourth stage, namely, follow-up. The survey report comprises 28 monographs, 11 of which have been issued as this is written; most of the other monographs either are in various stages of printing or are awaiting their turns at the Government Printing Office.

The follow-up work has been accomplished, in the first place, through circulation of the survey reports to State departments of public instruction, libraries, educational periodicals, and individuals who have special interests in certain specific monographs. In the second place, the survey findings have formed the basis for program presentations before a number of educational organizations operating nationally, regionally, or within States; some of these programs have been made up entirely of presentations on the survey; more frequently one or more discussions based on the survey were included with other program materials. The Office of Education has participated in 12 such conferences during the year.

The national survey of the education of teachers, begun in 1930, is nearing completion. Despite curtailed appropriations, the first volume of the survey, containing an extensive bibliography on the education of teachers, has been published, and the complete report, comprising approximately 1,300 printed pages in six volumes, will be ready for distribution during the year 1933. It will contain the following parts: Teacher supply and demand; student personnel; staff personnel; curricula for the education of teachers in normal schools and teachers colleges, and in colleges and universities; training schools and student teaching; summer sessions; graduate work; educational theories; education of negro teachers; history of teacher education; measurement of teaching ability; library facilities; reading interests of teachers; student welfare; in-service education of teachers; education of rural teachers; comparative practice in teacher education; digests of cooperative studies; and general summary and recommendations.

The office is planning to cooperate in any way possible with educational associations and institutions in making use of the findings of the survey, in extending the studies made, or in further study of the numerous problems discovered during the course of the 3-year investigation of the education of teachers.

*OTHER EDUCATIONAL SERVICE**CONSULTATIVE AND ADVISORY SERVICE*

On the whole a very considerable amount of time is given by the members of the staff to consulting with or in other ways assisting members of the staffs of organizations having common educational interests or problems. This service includes, among others, preparation of study outlines on educational subjects, providing selected bibliographies on special subjects, preparing programs for group meetings, reviewing or revising manuscripts, securing or preparing material for special purposes.

Recently the office has attempted to foster conferences in parent education at different universities and colleges for the purpose of bringing groups of parents there for intensive study of parent-teacher and other organization problems. A member of the staff took part in the 1932 summer school parent-teacher conference at Yale University during July and cooperated actively with the State University of Maryland in organizing and developing the program for the 1933 summer school parent-teacher conference. Materials have been prepared and distributed for this work.

At the request and under the auspices of the State departments of education and the State universities in Georgia and North Carolina, respectively, members of the staff have conducted short courses for county superintendents in the two States named. Continuing, advisory service is rendered by members of the staff to various organizations which they serve as officers or committee members.

COMPARATIVE EDUCATION PROBLEMS

In assisting college and university registrars and committees of admission to evaluate the credentials of foreign students, the office handled 626 requests with 1,642 separate documents in 33 languages for cases numbered serially 3485-G to 4110-F, inclusive. This was a decline of 193 from the 819 cases cared for in the previous fiscal year. In addition 118 cases were, for one reason or another, reviewed. As to countries of origin, 56 came from 15 countries in Latin America; 154 from 18 divisions of the British Commonwealth of Nations; 134 from 9 Germanic language countries; 83 from 6 Slavonic language groups; 23 from 9 Near East and 55 from 5 Far East countries; 90 from 7 European Latin-language nations; 21 from 5 Finno-Ugric language countries; and 10 from 3 of the outlying parts of the United States.

Students of comparative education write regularly to the office for aid, and the number desiring help is increasing annually. Bibliographies, loans of books and letters of direction and explanation were used in connection with studies 329-E to 461-S, inclusive, a total of 133 distinct studies as compared with 102 for the year 1931-32.

LIBRARY SERVICE

Besides serving the research staff of the Office of Education the library to a very large extent provides reference and research service to students of education outside of the office. There were 3,569 visitors using the reading room facilities during the past year while 4,196 volumes were charged for use outside the library. The continued improvement of the facilities for reference work is one of the major responsibilities of the library staff. With the augmented space allowed the library, the service to specialists, both inside and outside the office, has been carried on with marked increase in efficiency during the past year. The card catalog, the current file of college catalogs, and the reference collection have been made more accessible, and check lists of materials are available.

A further constant activity of the library staff is the development of adequate book collections in certain specialized fields bearing upon education. This past year the course of study collection has been amplified, catalogued, and made available in the reading room for very extensive use. Work has been begun on the collection of textbooks, probably more complete than in any other library in the country.

INFORMATION SERVICE

Distribution of published material.—Like many other enterprises, the Office of Education faces two problems, production and distribution.

How did the Office of Education distribute during the last fiscal year the facts which its research produced?

Distribution requires two processes: (1) preparation of the facts for easy transportation and hospitable reception, (2) actual dissemination.

1. Work in preparing facts for distribution

	Number	Pages
Manuscripts read and edited:		
For printing.....	52	{ 6, 488
School Life issues.....	10	{ 12, 089
For mimeographing.....	56	240
Number of galleys and pages of proof read.....		1, 008
News releases condensing facts for newspapers and magazines.....	42	7, 655
Radio releases for distributing facts by air.....	6	210
		24

¹ Bibliographical entries.

2. Dissemination

	Free	Sales
Number of copies of printed publications.....	155, 000	¹ 234, 854
School Life (monthly average, 1,445), annual.....	14, 450	² 84, 638
Reprints from School Life, extra editions, and index to School Life.....	17, 400	
Price lists.....	30, 000	
Circulars (mimeographed).....	82, 200	
Good reference series (mimeographed).....	4, 150	
General informational notices.....	243, 895	

¹ 1931 fiscal.

² 1933 fiscal.

Making maximum use of facts.—The aim of the Office of Education is to disperse facts widely. To do this we use as many avenues as possible. For example:

Pamphlet No. 34, *School Administrative Units*, contains these important points: United States has 127,000 school districts; one school board member to each two teachers.

Following are the avenues used to put this before the people:

1. Three thousand copies of Pamphlet No. 34 were sent free to State libraries, public, college and normal school libraries, State superintendents of education, State supervisors of rural education, ministers of education and foreign exchanges, legations and embassies of the United States, educational periodicals.

2. Two hundred and fifty-five copies have been sold through the Superintendent of Documents.

3. News release April 14, 1933, condensing facts in the pamphlet went to 250 Washington correspondents, 374 newspapers outside of Washington, 400 educational magazines. It was sent out on Associated Press wire to 1,500 newspapers and quoted in Hearst editorial. Also used in *Time* (400,000 circulation).

4. Condensed article in *School Life*, 20,000 readers.

5. Reprint made for American Legislators Association; 200 sent to leading State legislators.

6. Reported in columns prepared for *The Instructor* (140,000 circulation), and *Journal of the National Education Association* (200,000 circulation).

7. Radio releases, 249 stations.

Organized use of the radio as a medium for distributing Office of Education facts was started during the year. A specimen 5-minute radio release designed to be read at local stations was prepared and sent to all stations, with an offer to supply similar releases regularly. Two hundred and forty-nine stations responded requesting radio releases. Frequently the stations ask local school officials and teachers to present the release before the microphone.

Directories.—With 48 States and 127,000 separate and independent school districts, it is natural that educators, citizens, and business people turn to the central service of the Office of Education for director information. During the past year the following directories were published: *Educational Directory* in three parts—Part I, *Principal State and County School Officers and Other Educational Directories*; Part II, *Principal City School Officers and Catholic Parochial School Superintendents*; Part III, *Colleges and Universities (presidents and deans of schools)*; *Supplement to List of Accredited Secondary Schools*; *Supplement to List of Accredited Higher Institutions*; *Schools of Commerce and Bureaus of Business Research*.

Exhibits.—Exhibits of Office of Education publications and services were prepared for 25 educational association meetings.

Writings and addresses.—One hundred and sixty-nine articles were written for publication in periodicals and year books. During the year members of the staff made a total of 349 addresses before National, State, regional, and local groups. Eighteen radio talks were prepared and given,

Correspondence.—During the past year approximately 145,000 letters have been answered by the office.

APPROPRIATIONS

The following tabular statement gives a birdseye view of the funds available to the Office of Education from 1930 to 1934, a period of 5 years. The statement is arranged so as to differentiate the funds available for the regular and continuing work of the office from the funds provided for the special studies which have now been completed.

TABLE 2.—*Funds available to the Office of Education*

Object	1930	1931	1932	1933	1934
Salaries.....	\$230,960	\$253,880	\$280,000	¹ \$252,714	² \$210,000
General expenses.....	11,000	30,000	25,000	17,600	12,500
Printing.....	47,000	55,000	62,000	34,000	30,000
Total, regular work.....	288,960	338,880	367,000	304,314	252,500
Investigation of land-grant colleges.....	14,365				
Investigation of secondary education.....	50,000	100,000	75,000		
Investigation of teacher training.....		50,000	80,000	50,000	
Investigation of school finance.....			50,000		
Grand total.....	353,325	488,880	572,000	354,314	252,500

¹ The appropriation for salaries was \$250,000, to which were added transfers of \$30,000 from National Park Service and \$2,400 from general expenses, Office of Education, making a total of \$282,400. This amount was reduced by legislative furloughs and leave without pay to \$252,714.

² The appropriation for salaries was \$250,000, but the amount that may be expended has been reduced to \$210,000.

These data show that for 1932 the amount available for the regular work of the office was \$367,000, while for 1934 the amount is reduced to \$252,500, a reduction of 31.2 percent. This includes a reduction in the printing funds of more than 50 percent. The amount available for 1934 is less than the amount that was provided for the year 1925. This drastic reduction has rendered necessary the elimination of members of the staff and a considerable curtailment in the output of printed material so necessary to enable this office to function in an effective manner.

STAFF

At the beginning of the year the regular staff of the office numbered 100; during the year 35 temporary and part-time workers were employed on the national surveys. Because of the reduction in the salary appropriation it was necessary to close out 1 position in

February, 7 positions on April 15, and 1 position on June 30, and to require members of the staff to take a short furlough. Thus the office roll numbered 91 at the end of the year, with no temporary employees after June 30 when the national survey of teacher education closed. This is a small staff, unable to report in detail on educational conditions of such varied complexity as are those of this country, and to render the service needed by States and municipalities in the educational readjustments which are taking place. It will be necessary in the very near future to supplement the regular personnel with the service of experts called in for temporary service on particularly pressing problems.

REPORT ON HOWARD UNIVERSITY

Howard University was inspected in accordance with the law during the months of May and June 1933 by a committee of specialists of the Office of Education, appointed for this duty by the Commissioner of Education.

For the first time the university has felt seriously the effects of the depression. This is shown by a considerable decrease in enrollments. The depression has also checked somewhat the plans of expansion of the university in the enlargement of its teaching staff and in the development of the building program. Notwithstanding these difficulties the 10-year program of development has been followed as closely as the finances of the university would permit.

In order to meet the situation the administration has reduced the teaching and administrative staffs. The relative cost of administration and physical plant maintenance of the university has been considerably lessened during the past year.

Institutional policies.—The board of trustees at the meeting in April 1933 recommended a number of important administrative changes in the interest of economy and efficiency to take effect in the year 1934–35. The more important of these include the establishment of the graduate school to take the place of the present graduate division, and the consolidation of the college of education and the college of applied science with the college of liberal arts. It is also planned to discontinue the theological college, the correspondence courses, and evening courses in theology after this year. The graduate school of theology will be continued.

STUDENT BODY

Enrollment.—The grand total enrollment of the university for 1932–33 was 1,893, of whom 1,094 were men and 799 were women. For the year preceding the enrollment was 2,464, of whom 1,464 were men and 1,000 were women. This indicates a net loss of 571 students, or more than 23 percent. This loss was distributed quite evenly

among the several major divisions of the university, although the college of applied science and the theological schools registered slight gains.

THE TEACHING STAFF

The teaching staff of the university in 1932-33 included a grand total of 263 members of whom 152 were full-time and 111 were part-time teachers. These are the equivalent of a full-time staff of approximately 173 teachers. This shows a decrease of 13 full-time teachers and 5 part-time teachers from the number of teachers employed in 1931-32. These reductions have been found necessary in view of the decrease in enrollments and curtailments of the income of the university.

FINANCIAL STATUS OF THE UNIVERSITY

In 1932-33 the total income of the university was \$1,090,844.79, of which \$661,422.27 was from the Federal Government and \$429,422.52 from private and institutional sources. In 1931-32 the income from the Federal Government was \$1,277,380.50 and from private and institutional sources \$564,070.49, a total of \$1,841,450.99. This indicates a loss of \$750,606.20 in total income for 1932-33 as compared with the year preceding. However, this loss does not affect to so great an extent the income for operation and maintenance of the university for 1932-33, as \$602,380.56 of the 1931-32 income was for building construction, while for 1932-33 only \$29,891.35 was available for that purpose.

In 1932-33 the total operating expenditures were \$1,046,328.47, as against \$1,745,195 in 1931-32, certain amounts received from gifts for land each year being still unexpended.

PHYSICAL PLANT

During the year 1932-33 there was constructed a new reinforced concrete walking tunnel system for the distribution of heat, light, and power. This tunnel is 1 mile in length and consists of 5 by 7 feet and 4 by 4 feet tunnels for the distribution of heat, and a separate and distinct concrete-encased terra cotta system of distribution for the new high tension electric distribution service; also the installation of a new system of piping in the above-mentioned tunnel for the distribution of heat. There was also completed the emergency construction project which consists of new highways and the landscaping of the science quadrangle area.

REPORT ON LAND-GRANT COLLEGES AND UNIVERSITIES

The Secretary of the Interior is authorized by Congress to require annual reports in detail from the treasurers of the several land-grant institutions of the disbursements of the annual income received by

them under the Land-Grant Act of 1862 and supplementary acts, and annual reports from the presidents regarding the general operations of the institutions. This duty has been assigned by the Secretary of the Interior to the Office of Education.

Land-grant colleges and universities, generally known as agricultural and mechanical colleges, were established following the passage of the first Morrill Act of 1862. By the terms of this act, each State was entitled to receive an amount of public land (or land scrip) equal to 30,000 acres for each Senator and Representative in Congress to which such State was then entitled for the "endowment, support, and maintenance of at least one college where the leading object shall be to teach such branches of learning as are related to agriculture and the mechanic arts in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." This land is being gradually sold to create an endowment fund which in 1931-32 totaled \$22,497,000. In addition there remained more than \$6,000,000 worth of unsold land. The income from such fund and lands amounted to \$1,090,407 for that year.

By the second Morrill Act of 1890 and the Nelson amendment of 1907, the Federal Government aids these institutions further; since 1911 each State has received from the United States Treasury in accordance with the Morrill-Nelson Acts \$50,000 annually to be applied to salaries and facilities for instruction in specified subjects. Of the total appropriations in 1931-32 (\$2,550,000) 17.6 percent was spent for instruction in agriculture, 28.6 in engineering and the mechanic arts, 11 percent in English language, 8.1 percent in mathematical science, 26 percent in natural and physical sciences, 7.6 percent in economic sciences, and 1.1 percent in teacher preparation in agriculture and mechanic arts.

Thirty States and three Territories—Alaska, Hawaii, and Puerto Rico—maintain 1 land-grant institution each; Massachusetts maintains 2; and each of 17 Southern States maintains 2, 1 for whites and 1 for negroes. About 185,000 regular students of college grade enroll annually during the academic year in the land-grant colleges, about one out of every six college students in the United States. The latest inventory of the land-grant institutions (1931) revealed that more than \$390,000,000 was invested in the 52 institutions for white students, of which 58 percent was in buildings. In 1930-31 the total receipts of the 69 institutions amounted to more than 165 million dollars, of which there was derived from State sources 50.8 percent, Federal funds 10.7 percent, student fees 11.5 percent, and miscellaneous sources 27 percent.

NEEDS OF THE OFFICE

1. Previous sections of the report have called attention to the fact that the staff has been reduced considerably during the past year in order to keep within the salary appropriation. Further reductions in the staff are necessary during the present year 1934. Together these reductions involve curtailments in our work in elementary-school curriculum, rural-school supervision, education of physically handicapped children, home economics, commercial education, physical education, and statistics. At the same time that these reductions in the staff and in the fields of service provided by the office have been made, educational problems have increased rapidly in number and in complexity.

It is evident that the rather small research staff of the office will soon have to be supplemented. This may be done in two ways: It is possible by appointing a specialist for temporary service—that is, for 1 or more than 1 year—to the Office of Education's staff to secure expert research and service in a field which does not justify the creation of a permanent position. It is possible to secure the best specialists in the field for such temporary appointment due to the special professional opportunities which work in a Federal office provides. In the long run this type of appointment may be considered a decided economy since it avoids the necessity of adding rapidly to the permanent staff.

A second means of supplementing the work of the permanent staff is through conferences of specialists held for the consideration of specific problems and for the purpose of making definite recommendations on educational policies. In conferences of this sort the office can avail itself of the most expert service through the work of persons who could not under any circumstances be added permanently to the staff but who are more than willing to cooperate with the office on the study of problems which are of common interest. Plans for these temporary services should be worked out as soon as possible and provisions made for them through the salary and general expense appropriations.

2. Probably at no time have the problems of State educational officials been greater than they are at the present time. Problems of organization, administration, coordination of the various educational units, educational support, curriculum changes, and many others are demanding study and prompt administrative action. Part of the charge laid upon the office in the Organic Act of 1867 was "to promote the cause of education." It seems probable that in no way could the Federal Office of Education do more to promote the cause of education than to grant the requests for service which come to us from the State officials. Illustrations of those calls are numerous: assistance in re-

vising the accounting system, in holding training courses for county superintendents, in reviewing educational legislation, in surveying higher education facilities, in service to State-wide curriculum committees, and so on. To answer these requests adequately, additional funds should be provided for traveling expenses.

3. It is evident that a research staff is fairly limited in its means of reaching the public which it hopes to influence or the school officials which it hopes to serve. This can only be accomplished through personal contact or through written communications. Additional funds for publishing studies of the office are greatly needed if the results of important and expensive investigations are not to be lost or minimized. The publication fund, now less than half of what it was 2 years ago, is quite inadequate for the printing of the office studies.

FEDERAL BOARD FOR VOCATIONAL EDUCATION, 1933

(Dr. J. C. WRIGHT, Director)

(By Executive order of June 10, 1933, effective on August 10, the functions of the Federal Board for Vocational Education were transferred to the Department of the Interior, and the Board made an advisory board to act without compensation. On October 10, 1933, the Secretary of the Interior assigned the functions of the Board to the Commissioner of Education, the necessary personnel under the Board to be organized as a subdivision of Education under the general supervision of the Commissioner of Education, who was directed to proceed with the necessary reorganization of the Office of Education.)

REPORTS FROM THE STATES

The Board is required by the vocational educational and rehabilitation acts to include in its report to Congress the reports made by State boards on the administration of the acts by each State and the expenditure of the money allotted to each State. In compliance with this requirement data reported by the States have been compiled covering in detail by States, expenditures of Federal, State, and local money under State programs, enrollments in vocational classes of different types—evening, part-time, and all-day classes in the fields of agriculture, trades and industries, and homemaking—and number of disabled persons retrained and returned to self-supporting employment, or rendered other vocational rehabilitation services.

ENROLLMENT IN VOCATIONAL SCHOOLS

Under the State plans for voluntary cooperation of the States with the National Government, local programs have continued during the year in each of the 48 States, and in Hawaii and Puerto Rico, and have expanded in some States even under the extraordinary pressure for retrenchment in every branch of public expenditure.

For the first time in the history of the program, however, the total enrollment under State plans fell off from the total of the preceding year.

This decrease is one inevitable consequence of reduction in Federal, State, and local revenues available for vocational education. In this year as compared with the year preceding some \$3,276,000 less money was invested in these schools. Opportunities offered for vocational training were correspondingly reduced, and funds were not available for promoting vocational education in new areas, however urgent the need might be in such areas for widening the range of vocational training to embrace new occupations.

Decreases are, nevertheless, found principally in enrollments of employed workers in evening courses for vocational training and instruction supplementary to their daily employment, and in enrollments of young workers for part-time instruction. These decreases reflect principally the widespread condition of unemployment in

trades and industries. Obviously workers unemployed cannot take vocational courses "supplementary to their daily employment", since they have no such employment. As regards young workers, it is found that when unemployment increases, some of them who would under normal conditions enroll for vocational training during a part of their regular working day, return to the all-day schools for full-time attendance in vocational or other courses. But many cannot or at least do not do this. They continue for the time being neither at work nor in school of any sort. It may be noted further that during the past year, in New York City and in many other communities adult unemployed workers have enrolled in all-day schools for which no enrollments were reported under State vocational programs.

Enrollments in agricultural and home-economics schools, which have not been so directly affected by the unemployment situation, have continued to increase during 1933.

For the year ended June 30, enrollment in vocational schools and courses of all types conducted by local communities under State plans, totaled 1,149,495 boys and girls and adults of all ages, distributed as shown in table 1.

TABLE 1.—*Enrollment in vocational schools operated under State plans: Year ended June 30, 1933*¹

Type of school	Total	Agricultural	Trade and industrial	Home economics
Total				
All types.....	1,149,495	265,978	537,512	346,005
Evening.....	381,349	83,372	155,594	142,383
Part-time.....	299,685	12,558	255,397	31,730
Trade extension.....	82,513	12,558	38,225	31,730
General continuation.....	217,172	-----	217,172	-----
All-day.....	458,461	160,048	126,521	171,892
Day-unit.....	10,000	10,000	-----	-----
In schools federally aided				
All types.....	1,031,571	264,105	489,900	277,566
Evening.....	342,171	81,689	123,777	136,705
Part-time.....	299,492	12,558	255,204	31,730
Trade extension.....	82,352	12,558	38,064	31,730
General continuation.....	217,140	-----	217,140	-----
All-day.....	379,908	159,858	110,919	109,131
Day-unit.....	10,000	10,000	-----	-----
In schools not federally aided				
All types.....	117,924	1,873	47,612	68,439
Evening.....	39,178	1,683	31,817	5,678
Part-time.....	193	-----	193	-----
Trade extension.....	161	-----	161	-----
General continuation.....	32	-----	32	-----
All-day.....	78,553	190	15,602	62,761
Day-unit.....	-----	-----	-----	-----
Increase or decrease (—): 1933 compared with 1932				
All types.....	—26,667	8,723	—42,079	6,689
Evening.....	—19,556	—6,030	—3,465	—10,061
Part-time.....	—66,862	1,766	—61,540	—7,088
Trade extension.....	—12,531	1,766	—7,209	—7,088
General continuation.....	—54,331	-----	—54,331	-----
All-day.....	60,941	14,177	22,926	23,838
Day-unit.....	—1,190	—1,190	-----	-----

¹ Provisional figures.

As in other recent years enrollment during 1933 has been made up (1) of employed adult workers in evening classes for training along the lines of their daily employment, (2) of young workers who have dropped out of regular full-time day school and have enrolled in a vocational course for part-time instruction, and (3) of boys and girls taking vocational courses as regular full-time pupils in day schools. Classified by broad fields of vocational training, enrollments for 1933 included 265,978 farm boys and girls and adult farmers enrolled in vocational agriculture courses, 537,512 boys and girls and adult workers in trade and industrial courses, and 346,005 girls and women in home economics courses.

Total enrollments in agricultural, trade and industrial, and home economics courses in each of the 16 years since initiation of the program in 1917 are shown in table 2.

TABLE 2.—*Enrollment in vocational schools operated under State plans, by years: 1918-33*

Year	Total		Agricul- tural courses	Trade and industrial	Home eco- nomics
	Number	Increase			
1933 ¹	1, 149, 495	-26, 667	265, 978	537, 512	346, 005
1932.....	1, 176, 162	58, 606	257, 255	579, 591	339, 316
1931.....	1, 117, 556	53, 020	237, 200	602, 755	227, 601
1930.....	1, 064, 536	16, 560	193, 325	633, 153	238, 058
1929.....	1, 047, 976	48, 945	171, 466	627, 397	249, 113
1928.....	999, 031	87, 405	147, 481	619, 548	232, 002
1927.....	911, 626	26, 351	129, 032	564, 188	218, 406
1926.....	885, 275	92, 851	111, 585	537, 738	235, 952
1925.....	792, 424	102, 369	94, 765	490, 791	206, 868
1924.....	690, 055	153, 527	89, 640	428, 473	171, 942
1923.....	536, 528	60, 700	71, 298	325, 889	139, 341
1922.....	475, 828	151, 581	60, 236	296, 884	118, 708
1921.....	324, 247	59, 189	43, 352	217, 500	63, 395
1920.....	265, 058	70, 163	31, 301	184, 819	48, 938
1919.....	194, 895	30, 772	19, 933	135, 548	39, 414
1918.....	164, 123	-----	15, 450	117, 934	30, 799

¹ Provisional figures.

Diagram I shows enrollments each year by types of schools—evening, part-time, and all-day schools—for all schools operated under State plans.

EXPENDITURE OF FEDERAL, STATE, AND LOCAL MONEY

Total expenditures of Federal, State, and local money under State and Territorial plans for salaries of vocational teachers, salaries of State directors and supervisors of vocational agriculture and home economics, maintenance of vocational teacher training, and for vocational rehabilitation of disabled civilians, during the year ended June 30, 1933, are summarized in table 3. No Federal money is available for plant and equipment of vocational schools, and no expenditures of State or local money for plant and equipment of such schools are included in expenditures reported to the Federal Board and summarized in table 3.

DIAGRAM I.—*Enrollment in all schools operated under State plans, including federally aided and nonfederally aided, by years: 1918–33*

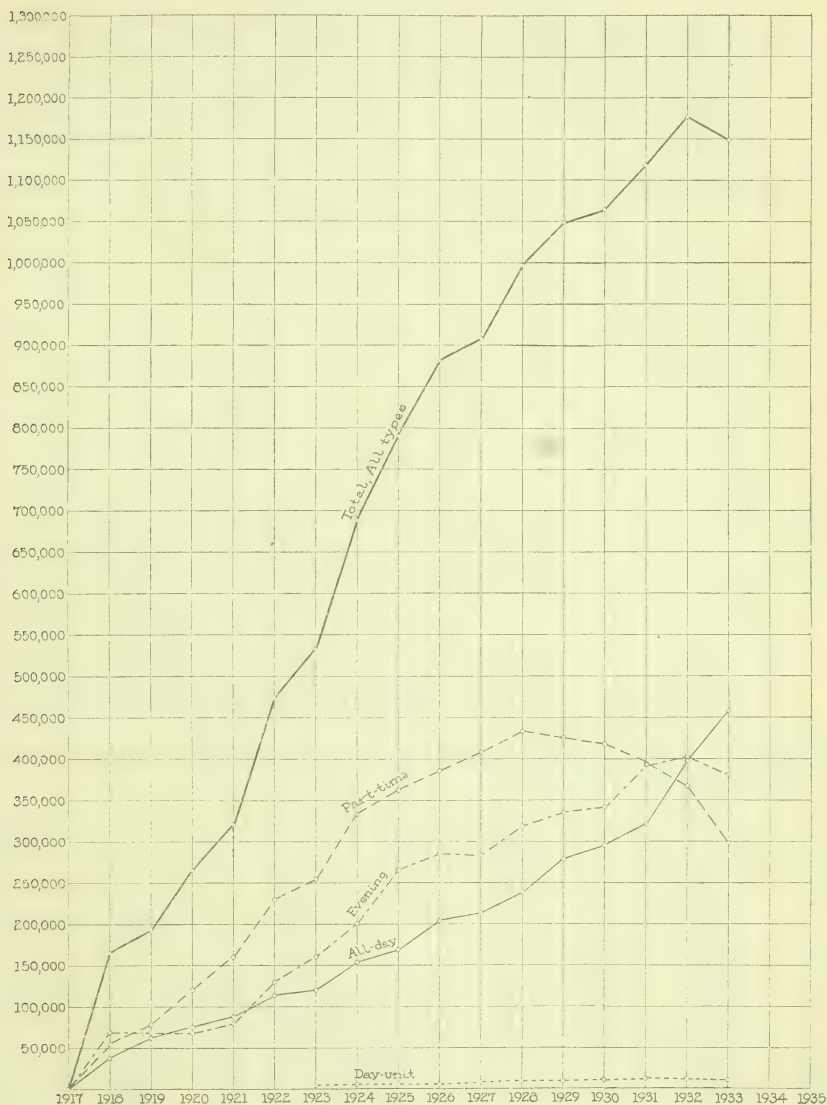


TABLE 3.—*Expenditure under State plans, year ended June 30, 1933*¹

Field of expenditure	Expenditure			State and local, per dollar of Federal money
	Total	Federal money	State and local money	
Vocational education.....	\$30,126,784	\$7,728,141	\$22,398,643	\$2.90
Vocational rehabilitation.....	2,176,126	1,011,440	1,164,686	1.15

¹ Provisional figures.

That the States and local communities have exerted every effort to maintain their programs of vocational education during the past 4 years of extraordinary pressure for economy will be apparent from the totals of expenditure for these years, as shown in table 4. In 1933 for the first time in the history of the program, expenditures both of Federal and State and local money fell off over the year.

DIAGRAM II.—*Expenditure of Federal, State, and local money for vocational education, by years, 1918-33*

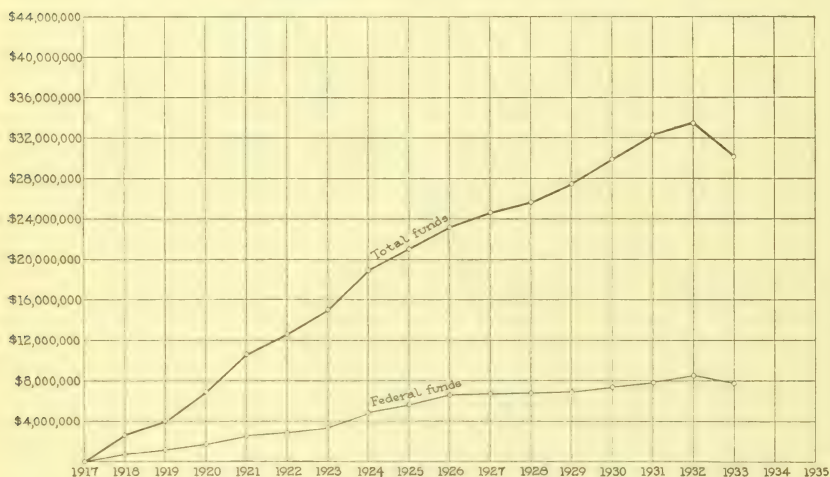


Diagram II shows total expenditure and expenditure from Federal funds each year, 1918-33.

TABLE 4.—*Expenditure of Federal, State, and local money under State plans for vocational education, 1929-33*

Year	Expenditure		Increase or decrease (—) in expenditure	
	From Federal funds	From State and local funds	From Federal funds	From State and local funds
1933 ¹	\$7,728,141	\$22,398,643	—\$686,693	—\$2,588,926
1932	8,414,834	24,987,569	436,105	823,106
1931	7,978,729	24,164,463	574,506	1,659,787
1930	7,404,223	22,504,675	525,693	1,908,900
1929	6,878,530	20,595,776	57,078	1,701,467

¹ Provisional figures.

In 1933 the States expended 97.3 percent of all Federal funds available for vocational education. Each year since 1920 the States have used over 90 percent of these Federal funds, and in recent years the small amounts unexpended have represented budgetary margins, and balances in special funds. The percentage expended each year is shown in Diagram III.

DIAGRAM III.—Percentage of Federal appropriations for vocational education used by States, by years, 1918–33

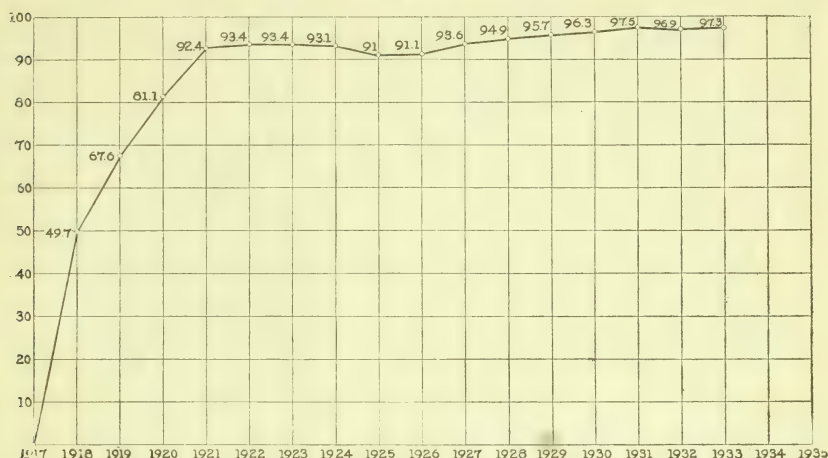


Table 5 shows expenditures of State and local money per dollar of Federal money expended under State plans in the several fields of vocational education and for vocational rehabilitation of disabled civilians, by years, 1918–33.

TABLE 5.—Expenditure of State and local money per dollar of Federal money expended, by years, 1918–33

Year ended June 30—	Vocational education					Vocational rehabilitation
	Total	Agriculture	Trade and industry	Home economics	Teacher training	
1933 ¹	\$2.90	\$1.81	\$4.92	\$3.19	\$1.38	\$1.15
1932.....	2.97	1.77	5.06	3.52	1.41	1.20
1931.....	3.03	1.88	4.74	4.42	1.45	1.19
1930.....	3.04	1.76	4.69	5.47	1.35	1.30
1929.....	2.99	1.90	4.17	7.11	1.33	1.24
1928.....	2.77	1.67	3.90	6.56	1.29	1.36
1927.....	2.65	1.67	3.67	5.88	1.33	1.23
1926.....	2.54	1.70	3.43	5.28	1.25	1.10
1925.....	2.73	1.72	3.85	6.36	1.30	1.18
1924.....	2.90	1.77	4.38	7.27	1.26	1.25
1923.....	2.98	1.78	4.58	8.61	1.21	1.26
1922.....	2.85	1.83	4.48	7.62	1.22	1.36
1921.....	2.76	1.85	4.26	8.47	1.19	-----
1920.....	2.45	1.74	3.85	5.77	1.25	-----
1919.....	2.17	1.67	3.08	3.78	1.31	-----
1918.....	2.65	1.71	4.00	4.79	1.21	-----

¹ Provisional figures.

ANTICIPATED UTILIZATION OF FEDERAL FUNDS UNDER STATE PROGRAMS

Under the vocational education and vocational rehabilitation acts, the States are required to plan out their work each year in advance, and the Federal agency for administering these acts is required "to ascertain annually whether the several States are using or are prepared to use the money received by them in accordance with the provisions" of the acts. The Federal agency is required further to submit to the

Bureau of the Budget estimates of expenditure of Federal funds under State plans early in each year for the succeeding fiscal year.

In compliance with these requirements an inquiry was addressed to State directors of vocational education in July 1932 to ascertain whether the States were prepared to use the full amount of Federal funds appropriated or authorized to be appropriated by Congress for the fiscal year ending June 30, 1934. A similar inquiry was addressed to State directors in August 1933 covering the fiscal year ending June 30, 1935. State directors were requested to state what would be the probable effects upon vocational programs in the States if the George-Reed Act, authorizing appropriations for agricultural and home-economics education should not be continued after June 30, 1934. Answers to these inquiries have been received from the State directors of vocational education in the 48 States, Hawaii, and Puerto Rico. The directors report that they are prepared to use Federal funds in 1935, including funds under the George-Reed Act. They call attention to the fact that State and local appropriations must be made in advance, that already in a number of States appropriations for 1935 to match Federal funds have been made, that these funds are essential to maintain established departments, and that emergency programs of relief and recovery necessitate not only continuance of all established vocational departments supported through the George-Reed Act, but a further extension of these programs.

State directors indicate the following consequences as inevitable if the George-Reed funds should be discontinued: (1) That many departments of vocational agriculture and a majority, if not in some States all departments of home economics will be eliminated; (2) that State funds already appropriated and contingent on the receipt of Federal funds will of necessity lapse; (3) that it will not be possible to utilize buildings and equipment specially provided for vocational departments of agriculture and home economics representing large expenditures of public funds; (4) that elimination of vocational work will result in still further overloading of academic courses with the consequent impairment of the work of the entire school system; (5) that rural communities will be even more severely taxed than they are now to meet the increased load if Federal support is withdrawn; (6) that contributions made by vocational departments under the George-Reed Act to relief and recovery programs in farming and homemaking will be abandoned; (7) that States will be unable to provide vocational training for large numbers of the unemployed; (8) that unemployment will be increased by discharge of vocational teachers now working under the act; and (9) that the morale of the State and local personnel will be seriously injured.

During the past year States and local communities have experienced serious embarrassment as a result of the reductions in the amount of Federal funds made available below the amounts originally appropriated or authorized by Congress to be appropriated for 1933. They have been further embarrassed by the uncertainty attaching to these appropriations, which has extended up to the beginning and even after the beginning of the fiscal year of the State or local community. Appropriations by the vocational education act of 1917 for allotment to the States for the fiscal year beginning July 1, 1932, were reduced by the Economy Act of June 30, 1932, from \$7,157,977.62 to \$6,442,179.81, and the appropriation under the George-Reed Act for this same fiscal year was reduced by the Independent Offices Appropriation Act of June 30, 1932, by \$500,000 below the amount authorized to be appropriated for this year.

Similar uncertainties as to the amounts of Federal money which would be available for the fiscal year beginning July 1, 1933, developed late in the fiscal year ended June 30, 1933. On June 16, the Bureau of the Budget advised that section 18 of the Executive order of June 10, 1933, "providing for abolishing of 25 percent of the functions of cooperative vocational education and rehabilitation, is to be construed as providing for a reduction of 25 percent in the appropriations which were made for your Board for the fiscal year 1933." Subsequently by Executive order of July 26, 1933, the effective date of section 18 of the Executive order of June 10 was deferred until 60 days after the convening of the second session of the Seventy-third Congress in January 1934. These uncertainties have meant that local communities could not be informed what amounts of Federal funds would be available for paying in part salaries of vocational teachers until after the beginning of their school years, when all budgetary commitments should have been consummated.

The States have been kept fully informed of these developments and have appreciated the extraordinary character of the emergency situation. In the interests of economy and efficiency, however, in the expenditure of local and State as well as of Federal funds under approved State plans, such uncertainties extending over into current fiscal years in these communities must obviously be eliminated to the full extent possible.

The States cooperating with the Federal Government in the vocational rehabilitation of disabled persons have appropriated State and local funds for 1934 in excess of the Federal funds available, indicating by these appropriations their intention of continuing their support of the program, and the anticipated utilization of all available Federal funds.

THE STATE OF WASHINGTON ACCEPTS THE VOCATIONAL REHABILITATION ACT

During the last session of its legislature, the State of Washington accepted the Federal Vocational Rehabilitation Act. Service for the vocational rehabilitation of disabled persons was accordingly initiated July 1, 1933. Forty-five of the forty-eight States are now cooperating in this work.

THE PROBLEM OF THE PHYSICALLY DISABLED

Among the principal causes of unemployment, even in normal times, must be included disabling accidents to workers, disease, and congenital defects. In periods of widespread unemployment all the difficulties confronting the physically handicapped worker are accentuated. In many thousands of cases, however, the physically disabled man or woman can even in such periods be trained for and placed in some useful employment, and be thereby rendered economically self-supporting. During the past year under State programs nearly 11,000 such men and women have in fact been so qualified for employment in some occupation for which their particular physical disability does not any longer constitute a vocational handicap, and more than half of these vocationally rehabilitated men and women have been placed permanently in employment. At the close of the year some 25,300 other physically disabled men and women were reported on the rolls of the State rehabilitation services as in process of being vocationally rehabilitated.

All of these dependent, disabled, and unemployed men and women on State rolls, when reported as rehabilitated, will have received expert vocational guidance leading to the selection of some occupation in which their disability will not be a vocational handicap, will have been thoroughly prepared for this occupation, placed in employment in it, and followed up for a period after placement to insure permanent restoration to self-supporting status.

Our national program of vocational rehabilitation of the physically disabled dealing with one aspect of the unemployment situation, has continued during the past year to report steady gains in its achievements. More disabled men and women have been rendered self-supporting during the past year than in any earlier year, although the conditions under which the program has operated have been much more difficult than in any earlier year. It is significant that even under these conditions of extraordinary difficulty the States generally have succeeded in maintaining their services, and that steady development of the national program has continued. All of the 45 States cooperating with the Federal Government in this program of vocational rehabilitation and occupational readjustment

for disabled men and women have indicated their intention to continue their joint support of the program and to expand their services further through provision of additional State and local funds.

As a further indication of development, it may be noted that the Federal act providing for the establishment of a national system of employment offices, becoming effective July 1, 1933, requires State employment office systems to cooperate with State vocational-rehabilitation departments. Plans have already been formulated in a number of States for giving effect to these cooperative relationships, and as the employment system is developed this cooperation between employment and vocational rehabilitation services will expand. Such cooperation will serve not only to prevent overlapping and duplication of service to the disabled, but also to facilitate administratively a unified and constructive service.

In the field of emergency relief for the unemployed, also, plans for cooperation of the national and State vocational-rehabilitation services with the National and State Emergency Relief Administrations are being developed to the end that during the present period of economic depression and unemployment a larger proportion of disabled persons may be taken off the rolls of those dependent upon public relief, and be prepared for and placed in some employment in which they will be self-supporting.

SERVICE TO THE STATES

Rendering service to the States for the promotion of vocational education and of vocational rehabilitation, the conduct of research in these fields, and administration of the several acts defining the purposes for which Federal money may be expended under approved State plans, are major functions of the Federal office.

The Federal acts expressly provide for cooperation with the States in the promotion of vocational education in the fields of agriculture, trades and industries, and homemaking, and for promotion of vocational rehabilitation of persons disabled in industry or otherwise and their return to civil employment.

All of this service during the past year, as in other years has been rendered in response to requests from State boards. It may be noted that service of this character does not imply any assumption of administrative responsibilities in the States or local communities in the organization or conduct of any vocational schools or classes. All such schools or classes which receive financial aid under the Smith-Hughes Act are organized and conducted by State and local authorities under State plans formulated in each State by the State board for vocational education, and all teachers are employed by State and local communities, and are paid out of Federal, State and local funds under reimbursement policies formulated by the States. On requests

from the States, assistance is given by Federal agents in the development of programs. Inquiries and requests for service from the States each year necessitate a large volume of correspondence on educational and technical problems, and in some cases the preparation of reports by the agents.

During the past year Federal representatives have assisted State officers in perfecting State plans under which local vocational programs are conducted; participated in conferences with State directors, supervisors, teacher trainers, local administrators, teachers, employers, and employment and placement agencies; prepared, assembled, and distributed material to aid the States and local communities in building up their programs; assisted in making surveys and special studies within the States; and cooperated with national associations and committees interested in vocational education.

In Hawaii an agent of the Trade and Industrial Education Service conducted two professional improvement courses for vocational teachers extending over a period of 3 weeks, and in a number of States trade and industrial agents have conducted, in response to requests originating in local communities, instructor-training courses for fire-department officers. They have cooperated with the United States Bureau of Indian Affairs in planning out a survey to formulate a vocational education program for Indian girls in the Northwest; with the Department of Justice in planning for organization of vocational classes for women in penal institutions; and with bureaus in the Departments of Agriculture, Labor, and Commerce, interested in the promotion of vocational education. Accompanied by State supervisors or other State officials, Federal agents have visited vocational schools in every section of the country to assist these schools with expert advice in improving their vocational programs. These services, although they have been exceedingly varied, have been nevertheless essentially similar in character to services rendered in other years. The trade and industrial staff has, however, during 1933 responded to numerous requests for service of an emergency character in assisting the States and local communities to develop vocational programs of emergency training and relief in the unemployment situation.

In the field of agriculture, as in other fields, Federal agents have assisted State supervisors to formulate their annual programs of work, have devoted much effort to helping States organize emergency programs, assisted State supervisors in putting over their programs with local teachers, and have surveyed teacher-training institutions in a number of States, making recommendations for improvement. They have assisted in the formulation of special courses of instruction to prepare persons who have for one reason or another abandoned other occupations to enter farming under the local conditions obtain-

ing in their respective communities. Up-to-date subject matter has been made available and organized for vocational courses, and special phases of the program, such as part-time and evening instruction for farmers have been promoted.

Funds made available under the George-Reed Act of 1929 have made possible some expansion of the home economics education staff to meet more adequately the needs of the rapidly expanding programs being developed in this field. School administrators have during recent years been attempting to build up programs in homemaking which would function effectively in the homes of their communities, and their demands for assistance in this effort have greatly exceeded the capacity even of the expanded staff. Nevertheless, the expansion of the service has made it possible to build up more effective plans for cooperation with the States, to participate more generally in State and local conferences of homemaking supervisors and teachers, and to cooperate more effectively with State supervisors and teacher-training staffs. Information required in dealing with local needs and problems has been prepared, compiled, and distributed to each State, and aid has been extended to State and local staffs in dealing with the homemaking problems of families of reduced incomes, and of those living on relief funds. Services have been rendered also in helping the States to develop programs to meet the needs of special groups, such as the foreign-born, and certain native-born groups whose social and economic status has made their home problems unique and difficult. In nearly all States, also, the increase of adult education in homemaking under the George-Reed Act has been reflected in increasing demands for service.

Special services rendered to the States in the field of commercial education have included aiding the Wisconsin State Board for Vocational Education in developing its experimental pioneer programs of training for workers employed in stores and in selling occupations; making a brief survey of the classes for unemployed commercial workers, and outlining a plan for organizing additional classes for unemployed salespeople and store workers in New York City; aiding the State supervisor of trade and industrial education in Delaware in improving a local program of vocational education in Wilmington for store managers and salespeople; aiding the Pennsylvania State Board for Vocational Education in developing a cooperative class in retail selling in Williamsport; conducting a 1-week conference for commercial teachers in the part-time schools of Tennessee; aiding the Office of Indian Affairs in developing in Haskell Institute, Kans., experimental classes for commercial pupils; aiding the director of the Department of Vocational Education of Ohio State University in organizing a program for training commercial teachers; and organization and conduct of a conference on reorganization of commercial courses in rural and small-town high schools.

Services rendered by agents of the Rehabilitation Service have included participation in State rehabilitation staff conferences, and in general conferences on programs for cooperation between, for example, State emergency relief administrations, State employment services, agencies for service to crippled children, and State boards for vocational education. They have assisted in promoting programs in the States generally; in formulating State plans; in promoting local participation in the State program under plans of cooperation between individual cities and the State; in interpreting rehabilitation policies in terms of individual cases; in promoting needed legislation in the States; and in improving the record, accounting, and bookkeeping systems in State offices. In each case the service rendered has been in response to a request from the State for assistance, and the particular service rendered has been determined by the problems and needs developing in the State.

RESEARCH IN THE FIELD OF VOCATIONAL EDUCATION

An inquiry undertaken at the request of the American Vocational Association has been in progress throughout the year. The executive committee of this association, at a meeting held in New York City in December of 1931, approved a recommendation for appointment of a committee of the association to study changing economic and social conditions, and problems involved in adapting programs of vocational education to these changes. In February of 1932 the executive committee voted to request the Federal service to assume responsibility for making this study, on the understanding that a committee of the association would serve in a cooperating and advisory capacity. In the following March the standing committee of the Federal service approved the proposal of the association and in June a conference of the committee members and others was called to discuss the projected research. Subsequent conferences with the advisory committee of the association were held in October 1932 and May 1933.

Social and economic changes surveyed in this study, as they affect vocational requirements being imposed upon wage earners, farmers, and homemakers, include the increasing mechanization of processes and increasing utilization of mechanical power in industry and agriculture, with the resultant displacement of labor, changing demands for skill, and insecurity of job tenure. Among other tendencies of significance for vocational programs are the increasing adoption by large corporations of scientific practices of personnel selection; the increasing demand for, and the rising standards of efficiency; the increasing specialization of processes and jobs; the increasing difficulty for workers of learning on the job in highly mechanized industries; the increasing demand for broad technical knowledge; the increasing need for interpretation in terms of trade techniques and farm practices

of the cumulating results of technological research; the increasing responsibilities of vocational programs in dealing with such large population drifts as the migration from farm to city, and from city to farm; the increasing need for development of live-at-home programs, especially in a period of reduced incomes and of widespread unemployment; the increasing educational disability of rural areas; the increasing urbanization of the home, socialization of the homemaker's job, and rising standards of efficiency in homemaking; and the rising age of entrance into employment, with the very serious resultant social problem of what to do with the 14- to 18-year-old boy or girl who is being barred from employment to a more advanced age.

In its larger aspects the problem presented in this inquiry may be defined as the problem of determining in what ways vocational programs can be made to function effectively in maintaining for our workers continuous occupational adjustment, thereby avoiding as far as may be possible displacement and unemployment in the face of an intensely dynamic economic situation. In this matter of vocational training and adjustment the obligation of society extends to workers of all classes. And it is not limited to youth. It extends to workers of all ages, employed and unemployed, more particularly in the present situation to adult workers being thrown out of occupational adjustment by the continuous economic, technological, and social changes. These changes present unlimited possibilities for advancing society's welfare, but they present at the same time serious problems of economic insecurity of our workers, with which society and specifically our programs of vocational education supported out of public funds must deal.

Other research in progress during the past year has included a survey of the pulp and paper industry and elaboration of a scheme for training workers in this important industry. This study has been checked by officials in 23 establishments as regards the processes of manufacture and the analysis of jobs in the industry, and instructional units for training personnel have been outlined on the basis of the survey. A similar study has been made of the foundry industry in 15 plants in 12 cities of one State. An analysis and compilation of Census data for States and local communities has been made showing occupational changes and the significance of these changes for vocational programs. A follow-up study, begun in 1927, to determine what becomes of the trade-school graduate has been continued. A bulletin on "Vocational training for aviation mechanics" has been completed and made available for distribution; and material has been prepared on new types of industrial classes, on special problems in vocational education, on training workers in oil fields, and on procedures to be followed in organizing and maintaining a vocational program in line with local community needs.

In the field of vocational agriculture a study has been in progress to determine the needs of out-of-school farm boys for vocational training. Also a study of placement opportunities for farm operators enrolled in agricultural part-time schools—the first systematic study of placement in the field of agricultural education of less than college grade. A follow-up study of former students of vocational agriculture now engaged in farming as operators has been in progress. One cooperative research has dealt with the organization and conditions essential for successful functioning of agricultural programs in small rural high schools. The results of research conducted in the Department of Agriculture have been analyzed and organized in separate publications for utilization by teachers giving vocational instruction in farm forestry, in grading feeder and stocker steers, in marketing poultry products, and in controlling loose smuts of wheat and barley. Two bulletins have been published, one on the organization and conduct of agricultural part-time schools; and one on the earning ability of farmers who have received, as compared with those who had not received, vocational training.

In the Home Economics Education Service a bulletin entitled "The home project in homemaking education" was prepared during the year, dealing with the selection, planning, and conduct of such projects in connection with systematic instruction in homemaking. Home projects provide practical training in homemaking, supplementary to the classroom instruction, as do the supervised practices or projects of students enrolled in vocational agriculture. The bulletin is based on a broad survey of experience in the States. These projects afford unique opportunities for adapting homemaking instruction to the needs and resources of individual families in planning and preparing food for the family that is adequate and can be provided within the food allowances of reduced incomes or grants of relief to dependent families; in preserving home-grown fruits and vegetables; in making clothing from materials on hand; or in planning recreation for the family at little or no cost. Superintendents and teachers generally bear witness to the outstanding values of home-project instruction given under the cooperative guidance of parents and teachers. Much effort during the past year has in this service been devoted to the coordination of the extensive research being conducted in the field of homemaking throughout the country.

A preliminary draft for a bulletin on trends in commercial occupations was partially prepared during the year. It has become apparent on a survey of trends in employment of clerks, sales people, and other commercial workers, that the number and proportion of workers in these employments have been increasing rapidly in recent decades. In 1930, 1 in 8 workers was engaged in some recognized commercial pursuit. Research in the commercial field during the past year in

response to requests from the States has included a brief survey of classes being conducted for unemployed commercial workers in New York City and outlining a plan to be followed in expanding this program; and two reports, one for the superintendent of schools in Wisconsin, and one for the director of vocational education of Kentucky, on the relation of high school commercial courses to commercial occupations in the State. Tentative drafts of objectives for commercial courses on a vocational level were prepared, one for the commercial section of the American Vocational Association, and one for the Department of Business Education of the National Education Association.

During the year material was compiled by the Rehabilitation Service for a bulletin on "Office procedure in vocational rehabilitation", which discusses forms, files, and procedures employed. A bulletin entitled "Administration of vocational rehabilitation—A statement of policies", published originally in 1926, was revised to bring the material therein up to date, and to include additional policies formulated since the original publication. Material was collected in the States on cases of physically handicapped persons rehabilitated by the States during the fiscal year 1931-32, the purpose of the study being to ascertain the means by which these disabled persons have secured employment after having been prepared for it through rehabilitation procedure. Material was collected also on rehabilitation cases undertaken in the States and subsequently closed without effecting complete rehabilitation; and some material was gathered for a study of small business enterprises as providing suitable undertakings for rehabilitated persons.

ADMINISTRATION OF THE FEDERAL ACTS

Administration of the several acts under which Federal money is allotted to the States—in the total amount under all acts in 1933 of \$9,161,000—for expenditure under State plans constitutes, as has been noted, a third major function of the Federal staff, in addition to its functions of service and research. Allotments under the several acts for the year ended June 30, 1933, were in the following amounts:

Funds appropriated for allotment to the States; year ended June 30, 1933

Act	Basis of allotment	Amount
Total.....		\$9,161,300
Vocational education:		
Smith-Hughes Act, total.....		6,450,300
Vocational agriculture.....	Rural population.....	2,724,300
Vocational trade and industry.....	Urban population.....	2,745,000
Vocational teacher training.....	Total population.....	951,000
George-Reed Act, total.....		1,500,000
Vocational agriculture.....	Farm population.....	750,000
Vocational home economics.....	Rural population.....	750,000
Vocational rehabilitation.....	Total population.....	1,097,000
Hawaii.....		27,000
Puerto Rico.....		75,000
District of Columbia, vocational rehabilitation....		12,000

Allotments of these appropriations involves determination of the amount of allotments to which each State is entitled on the basis of its total, urban, rural, or farm population at the last census; determination of unexpended balances in State treasuries carried over from allotments in the preceding year; verification of State financial reports of expenditures during the year, and disallowance of any expenditures found to have been made not in accordance with the provisions of the acts making the appropriations; and finally certification to the Treasury of the quarterly or semiannual payments to be sent to the States under each act.

These procedures necessarily involve a very considerable amount of clerical work in computing allotments, balances, and payments, and in preparing certifications to the Treasury. They involve, also, auditing of State reports by agents and other members of the staff who are entirely familiar with the statutory provisions under which the Federal money is made available for expenditure under State plans. Finally they involve each year a very considerable amount of correspondence with State officials incidental to the distribution of report forms, the securing of reports, the auditing of the reports, and the notification of payments certified to the Treasury.

THE PROBLEM OF THE 14 TO 16 YEAR OLD BOY OR GIRL

Undoubtedly the most serious problem emerging during the past few years in the field of education has been the problem of what to do with the 14- to 16-year-old boy or girl, who has completed the requirements of compulsory full-time school attendance and is still too young for wage-earning employment. The period of compulsory full-time school attendance has been extended in some States to 16 years, with provision for part-time attendance in continuation schools for employed young workers even beyond that age, but in a majority of States there is a gap between the age of release from compulsory full-time school attendance and the minimum age of employment as fixed in child-labor legislation, or as determined independently by industry, which of its own initiative has been more generally refusing to employ workers under 16, and even in some occupations under 18 years of age.

This gap comes at precisely that age of adolescence when guidance and direction are most essential for the future welfare of the boy or girl. Opportunities for employment of these youths, freely, or under work permits requiring part-time attendance at continuation schools, have been gradually diminishing over a period of years, but during the past year *codes prepared under the National Recovery Act have been so drawn as practically to eliminate all employment in these ages by fixing the minimum age of employment at 16 years.*

As regards the minimum age of employment, the policy written into these emergency codes will, it may be assumed, be continued as a permanent policy after the present emergency has entirely passed. So that the 14 to 16 year old boy or girl will not be permitted in the future to enter upon any wage-earning employment in competition with older workers. These young workers are not any longer wanted in industry. They are too immature for profitable employment. There is no economic necessity for their employment, and society has at last determined to eliminate the evils of child labor.

Under the vocational education act one third of the Federal funds provided for trade and industrial education, if expended in the States, must be expended for part-time schools, that is to say, for schools providing instruction during a part of the regular working time for young workers over 14 years of age. It would appear that these schools must in the future be operated almost exclusively for workers over 16 years of age. Also, it would appear that the 14 to 16 year old boy or girl must in the future continue on in full-time attendance at the regular day school; since it is inconceivable that public opinion or the interest of parents in the welfare of their children should tolerate complete denial of all opportunity to these 14 to 16 year old boys and girls either of employment or of continued education.

Obligation rests directly upon school authorities to face the problem of providing for this group of future citizens, who cannot benefit by further formal academic instruction, some alternative educational discipline from which they may be reasonably expected to derive benefit.

THE NEED FOR CONTINUOUS SERVICE FOR ADULT WORKERS

As regards training for skilled trades, vocational programs throughout the country have been largely developed on the traditional apprenticeship theory that a worker could be trained once for all in the technic of his trade, by serving a regular apprenticeship in it. For some of the training provided under indentures of apprenticeship, organized training in vocational courses has been substituted under conditions developing in our mechanized industries to which traditional apprenticeship methods of training could not be adapted. But the theory that the worker could be trained once for all, either as an apprentice or as a pupil enrolled in a vocational course or by some combination of apprenticeship and organized training, has persisted. This theory assumes a static condition of the industrial arts, which was true of these arts over a long period preceding the development of our power-driven machine industries, and preceding the progressive and accelerating applications of science in developing new processes and in improving the technics of production. But it is not valid under present-day conditions.

Conditions of production are different today from conditions in any earlier period. For vocational programs the more significant fact is that no assumption that they are static can be justified. Rather it is true that technological advance is proceeding at such a rapid pace that the thoroughly trained artisan of today may be confronted tomorrow with the demand for a new trade skill or technic for which his past training and experience has little or no value. Technological advance is continuously devaluing and eliminating the need for the acquired skills and technics on the one hand, and on the other continuously setting up new requirements for the workers.

While changes of this character are continuously taking place in one or another industry or line of employment, they are as regards individual industries and individual workers accidental and unpredictable, being dependent upon the accidental progress of invention and science in the field of production. Obviously no vocational course can take account of these changes before they occur, and train young workers for the new technics which are certain to develop from time to time during their life period as adult workers. The need for additional training may develop for the adult worker at any age, and this need can be met only by maintaining a training service paralleling developments in the trade, and made available to the adult workers on occasion as the need for training develops.

While technological advance resulting from the application of science and the progress of invention is more commonly thought of in connection with our manufacturing industries, changes of this character extend over into other fields of vocational training, developing in these fields corresponding needs of training service for adult workers. In all fields, moreover, the need of the adult for continuous training service is urgent for other reasons. In agriculture, for example, many millions of dollars are expended out of public funds each year for technological research. As reported by the Department of Agriculture, research of this character being conducted by experiment stations in 1931 included over 5,000 separate projects in agricultural chemistry, soils, fertilizers, crops, genetics, horticulture, forestry, plant diseases, animal production, dairying, agricultural engineering, foods, and other lines. On the basis of this research an immense volume of literature is prepared each year. It is no reflection whatever upon the farmer to say that he is finding it impossible to keep up with this research even in his own particular line of farming. His full-time job is farming rather than following the advance of technological research. Nevertheless, the single purpose of the research is to help the individual farmer, and one principal responsibility of the vocational teacher is to render continuous service in his community to the adult farmer in interpreting the results of this research in terms of everyday farm practices.

In the field of homemaking, also, the need of the adult for service is a continuing need. Science is continuously occupied with discovering new ways and means of safeguarding the family health which, if they are to benefit society, must be carried over from the field of science into the field of everyday homemaking. Obviously the homemaker cannot unassisted follow the progress of medical science and modify her homemaking practice accordingly. In this business of safeguarding health—which has been estimated to cost the community some \$3,500,000,000 a year—as well as in many other phases of the business of safeguarding the family welfare, the homemaker needs every aid that can be extended to her.

INCREASING NEED FOR TRAINING TECHNICIANS

With the increasing mechanization of industry and use of mechanical power, and the rapid accumulation of the results of scientific research of vocational significance in many lines of employment, the demand for technical experts has increased correspondingly in recent years, and increased, it would appear from recent surveys, out of proportion to the increase in provisions being made in vocational programs for training such workers.

The increasing value of broad technical knowledge in industrial fields is generally recognized. For the industrial technician the training is of a subprofessional grade, as compared with the training of the industrial engineer, and the demand for this subprofessional training appears to have been in general less adequately met than has the demand for training industrial engineers. It may be added that the training required by the technician is a type of training which can commonly be most advantageously provided in organized courses, and a type of training also which industry can seldom provide economically if at all.

THE BACK-TO-THE-FARM AND FARM-FACTORY MOVEMENT

Each year hundreds of thousands of urban workers with their families, voluntarily or under pressure of economic necessity, leave the city for the country, and other hundreds of thousands of farm boys and adult farmers with their families leave the farm for the city. This interchange of population between city and country is always running in large volume. The urban worker moving out into the country must learn to live there by farming or possibly by some other trade—probably not his old one. He and his family must learn to live in the country, where all the conditions of earning a living and of living in the home are different from those to which they have been accustomed.

It is, of course, not the net population drift either into or out of the city that measures the dimensions of the adjustment problem set up

for vocational education, but is rather the mass population change both ways.

In the present situation of widespread unemployment in industrial centers, however, and for several years back it happens that the net drift has been away from the city—a net back-to-the-farm movement. Moreover, in this emergency the National Government has set aside a large sum of Federal money for the express purpose of moving families out of certain industrial and mining centers where they could not be self-sustaining, and establishing them in homesteads organized in small rural communities where they can become self-sustaining.

As an initial move under this national program a small group of West Virginia coal miners, proved by adequate tests to be “potential farmers”, have been selected with their families “as the pioneers on the first Federal farm-factory project.” The homes of these selected miners were visited and the homemaker interviewed, since it was realized that it was essential that she, as well as the miner himself, should be fit for the undertaking.

Society has definitely assumed responsibility for enabling these miners to become self-supporting in a rural community to be organized by them under Government supervision and with the aid of Federal funds. They are “potential” farmers, and are to become real farmers. This means that they must be taught how to farm for home consumption. But more than this, since it is a “farm-factory” rather than simply a farm project they must be taught also to engage in some subsidiary craft or trade, suitable for the rural community or the home by which they can supplement the family income.

This national enterprise may present to vocational teachers an opportunity for cooperative service of far-reaching social value. The conditions with which the present emergency program proposes to deal are not essentially emergency conditions. They obtain more or less generally in all periods in some localities, and the problems presented to vocational education are essentially permanent rather than emergency problems.

PART-TIME FARMERS AND GARDENERS

The drift of population away from urban centers during the past few years has not been altogether—although it has been in some large measure—a going-back-home or a back-to-the-farm movement of unemployed workers with their families. It has embraced also in increasing volume a drift out of congested urban areas into nearby suburban districts, where the worker could secure a piece of ground for farming on a small scale or for a home garden.

Even the worker who has held his job in the city continuously has in many thousands of instances moved his family out into the country.

He may have continued to be an urbanite, working at his regular job full time or part time, or employed casually at odd jobs, but he has planted "one foot in the country", and has in many instances become a part-time farmer or gardener. In a majority of these cases he has probably brought with him little if anything in the way of capital resources, or knowledge either of farming or gardening. He has planned to cultivate his small plot of land mainly for home consumption, and has in many instances received the cooperative assistance of social agencies in planning to do this.

The problem presented to local programs of vocational agriculture by such part-time workers in agriculture, whose number has been rapidly increasing in recent years, is obviously different from that presented by the adult farmer or the farm boy engaged in or preparing to engage in some type of farming as a full-time business. The need of the suburbanite taking on gardening or small farming as a side line is for the development of a live-at-home program, rather than of a technical farming or farm-marketing program.

This dispersion of urban populations, and development of part-time gardening or farming in suburban areas as a means of eking out family incomes, may be expected to continue in increased volume in the future. Improved facilities for transportation may be indicated as one condition justifying this expectation. The automobile and other means of transportation are bringing a wider range of suburban areas within the residential district of urban centers, and making it possible for the urban worker to live in the open country where the conditions of living for his family are more favorable than those of the city.

COOPERATIVE EFFORT UNDER LIVE-AT-HOME PROGRAMS

For these urban families living in the country the problem of developing live-at-home programs breaks over into the field of home economics, since in any rational procedure the first step in farming for the family, even on a part-time basis, must be to formulate a budget of family needs in terms of foods that can be economically produced at home. Defining these family needs is a problem in home economics, while supplying them from the home farm or garden is an enterprise in the field of vocational agriculture.

In this situation a challenging opportunity is presented to vocational teachers of home economics and of agriculture for cooperative effort in helping these hundreds of thousands of urban families with "one foot in the country" to plan out and successfully carry out feasible live-at-home programs.

The farm-factory projects, being undertaken by the National Government, are even more broadly cooperative projects in vocational education under public supervision and with Federal aid.

Each such undertaking is a joint project in vocational agriculture, vocational trade or industry, and vocational homemaking. In the case of each family the industrial worker must be taught to farm for home consumption, and to work in off seasons at some new trade, while the homemaker must be taught to budget her needs for food and other necessities, and generally to conduct the home under a live-at-home program.

THE WAGE-EARNING HOMEMAKER

At the census of 1930 over 3,000,000 married women were reported to be gainfully employed. This total does not include all married women who were contributing to the family income, but only those reporting some gainful employment as a principal source of income. On comparison with earlier years the census found that the proportion gainfully occupied among married women had been increasing markedly over a considerable period in all sections of the country. It ranged in 1930 from 5.9 percent in North Dakota to 24 percent in South Carolina, and in cities of 100,000 or more population, from 4.6 to 33.4 percent.

Separate returns were made at the census of 1930 for "homemakers", including in this class the woman member of each family, exclusive of hired housekeepers, who was responsible for the care of the home. Of these homemakers nearly 4,000,000 or 13.8 percent were reported to be gainfully occupied (3,923,516 in a total of 28,405,294). Four out of five of the wage-earning homemakers were employed away from home as professional workers (388,000); office workers (501,000); industrial workers (737,000); servants, waitresses, etc. (958,000); saleswomen (272,000); or workers in other occupations (298,000).

Surveys in different localities of families with earning wives or mothers have found that in many instances young children must be left to their own devices, while the homemaker under the pressure of economic necessity is working away from home. Mothers of very young children may attempt to solve the problem of combining homemaking with wage earning by securing wage-earning employment at home, but such employment is not available in all cases.

The homemaker who must combine wage earning employment at the home presents a difficult problem to homemaking programs. In the local situation the problem may be of large or small dimensions according to the economic status of the homes in the given community, but the needs of the wage-earning homemaker for expert assistance in safeguarding the welfare of the family may be very different from those of other homemakers, and may be at the same time extremely urgent. The increasing tendency of homemakers to add wage earning to their homemaking responsibilities is one to which those responsible for developing local programs must give serious consideration.

VOCATIONAL TRAINING AS A MEANS OF INDUSTRIAL RECOVERY

During the past year emergency vocational programs have been organized to meet the needs of unemployed workers, and during the last months of the year plans were formulated for extending these programs on a nation-wide basis, under arrangements for cooperation of established national, State, and local agencies of vocational education with the newly organized National and State emergency relief administrations.

A fact of large significance for industrial recovery programs in the present situation is that even trained workers, who have been displaced or let out in the period of recession, can in a large proportion of instances never be taken back on the pay rolls of industry at their old jobs, either during or following the period of resumption. For industrial recovery their training and experience will have become misfit training and experience as a result of technological advance in all industries. Following any period of depression industrial recovery is always on a new basis. Old processes and equipment have been permanently discarded, and more economical processes calling for new trade skills are being introduced.

Vocational training for these new technics is as important an item in the program of industrial recovery as it is in the program of emergency unemployment relief, since industry cannot possibly resume activities on the new basis with a labor force untrained in these technics.

It follows that as business resumes in the immediate future, the problem of recovery both for industries and for workers will be not a problem of getting the millions of unemployed workers back on their old jobs, or on any other jobs for which their acquired training and experience has fitted them. For millions of those now unemployed traditional trade skill and occupational experience, acquired in the predepression period, will very generally have gone into the discard as part of the price society must pay for resumption of activities at all under the intensified competitive pressure for economy which always characterizes a period of recovery. Industrial recovery and elimination of unemployment will accordingly be not simply a placement procedure of returning labor to jobs for which they are fitted, but rather a training procedure of preparing labor for the new jobs that have become available.

It is highly essential that State and local administrators of vocational programs and vocational teachers throughout the country shall realize that this retraining of workers of all ages in new technics is bound to become in the near future—is in fact already becoming as unemployed workers are being put back on the pay rolls of industry—a prime responsibility of these programs; and that vocational education must, if it is to justify itself to the community which has provided financial support out of public funds for such education, *function effectively as one social agency of industrial recovery.*

MAINTENANCE OF OCCUPATIONAL ADJUSTMENT

It has been noted that science and technology "have helped form a society in which chronic insecurity is such a factor in the lives of the majority of men and women that insecurity and the fear it engenders have come to be counted as the chief motives which drive men to work, achievement, and thrift." Many factors undoubtedly enter into this situation. The problem is not a simple one, but the evidence is conclusive that insecurity for the worker has developed more or less in proportion, as under rapidly changing conditions, his past training for and experience in his occupation has become inadequate or misfit training and experience, and has tended to get out of line with the new requirements being imposed upon him by scientific and technological advance. To this extent the indicated remedy must be found in more adequate and practical vocational training based upon these new requirements.

Maintenance of occupational adjustment—which means avoidance, so far as possible, of the displacement and unemployment of labor commonly consequent upon scientific and technological advance and upon other social and economic changes in the conditions of employment—is in its technical aspects one large responsibility of vocational education. In its broader aspects the problem of maintaining occupational adjustment throughout our working population is, of course, a problem to the solution of which many other agencies, public and private, as well as vocational education must contribute. But whatever the contribution of other social agencies may be, it will always be true that *keeping labor fit for useful employment under constantly changing conditions and requirements being imposed upon the worker will be the special job of vocational education.*

THE NEW DEAL IN SECONDARY EDUCATION

The increasing economic insecurity of the adult worker in practically all fields of employment, and the careless abandonment of the youth of the country, at least in some communities, to idleness and aimless drifting or at best to misfit educational discipline during the years when they particularly need aid, guidance, and a discipline that will have a life-long practical as well as cultural value for them, undoubtedly present the more serious problems emerging in our present economic order.

With these problems vocational education has been continuously dealing since 1917, the year in which Congress enacted and President Wilson approved the vocational education act providing for national cooperation with the States in the promotion of vocational education under public supervision and adapted to the needs of the wage earner, the farmer, and the homemaker.

As a general proposition there can be no economy or assurance of welfare for the worker in any policy of leaving the worker untrained

for his job, or in taking chances that he may drift into some job for which he is or can eventually become fitted. Inefficiency is a waste of potential capacities of the worker, and the cost of this waste by and large undoubtedly exceeds the cost of rendering labor efficient. The aimless drifting of workers into certain fields of employment, whether or not there is a demand for their services in these fields, results in overcrowding of certain occupations and deficiency of workers in other occupations. The untrained worker is in the most overcrowded group of all—the group of unemployables. Vocational guidance and training is the rational social method of stopping this aimless drifting into overcrowded occupations, of drawing off surplus labor from these occupations into new and expanding fields of employment, and of *eliminating the unemployable worker by fitting him or some useful employment.*

INCREASING NEED FOR FEDERAL AID

Reports received from the 48 States indicate that the need for Federal aid to vocational education in practically every State is greater today than in any earlier period.

In part this need reflects today emergency conditions under which local and State funds available for public education have been very materially reduced, and vocational along with other educational programs correspondingly curtailed. Under these conditions the States and local communities have been forced to appeal to the National Government for increased cooperative assistance in preserving our public school system throughout the country. Not to respond to this appeal would be a national calamity.

In the field of vocational education the increasing urgency of the need for Federal aid reflects the rapidly changing social and economic situation, which during the past few years has been imposing upon local communities heavier burdens for occupational adjustment of workers being displaced by technological and other changes. All problems of administration and supervision of vocational schools, as well as of organizing instruction in them to enable them to function effectively in training our wage workers, farmers, and homemakers under rapidly changing conditions have become increasingly difficult.

Much has been achieved under cooperative national, State, and local leadership during the past decade and a half. Much more remains to be achieved. It is highly essential that our cooperative vocational program shall continue unimpaired, and that to assure continuous achievement in the future the appropriations provided in the Federal acts be continued in full amount. It is of vital importance that the period of the George-Reed Act, providing funds for agricultural and home economics education, be extended in accordance with the original intention of Congress.

ST. ELIZABETHS HOSPITAL

(Dr. WILLIAM A. WHITE, Superintendent)

On June 30, 1933, 4,981 patients remained in St. Elizabeths Hospital as compared with 4,930 on June 30, 1932, an increase of 51. This low increase is due mainly to the transferring of 115 Veterans' Administration patients to Veterans' Administration facilities during the month of June 1933.

The total number of patients under treatment during the year was 5,841, as compared with 5,579 for the preceding year, an increase of 262. The total number of admissions during the year was 911, the greatest number since 1923, as compared with 858 for the preceding year, an increase of 53, or about 6 percent. The total number of discharges for the year was 582, as compared with 401 for the preceding year, an increase of 181, or 31 percent. The total number of deaths for the year was 278, as compared with 248 for the previous year, an increase of 30, or about 12 percent. The total number of discharges and deaths, combined, was 860, compared with 649 for the preceding year, an increase of 211, or 32.36 percent.

There were 61 burials in the hospital cemetery, as compared with 43 the preceding year. With the cooperation of the War Department the bodies of 7 honorably discharged (indigent) service men were buried in the Arlington National Cemetery without direct money outlay; and 42 bodies were buried in Arlington Cemetery either at Federal or private expense, by outside undertakers. The remaining 168 bodies were removed by outside undertakers for private burial.

The daily average population was 5,036, an increase of 238 over the 4,798 for the preceding year, there having been an average increase of 196 for 1932, 212 for 1931, and 188 for each of the fiscal years 1930 and 1929, or a total of 1,022 patients since July 1, 1929.

Movement of patient population, fiscal year 1933

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1932.....	2,651	760	3,411	901	618	1,519	4,930
Admitted during year ended June 30, 1932....	443	179	622	177	112	289	911
Total number under care and treatment during year ended June 30, 1932.....	3,094	939	4,033	1,078	730	1,808	5,841
Discharged as—							
Not insane.....	11	10	21	2	1	3	24
Recovered.....	76	18	94	17	23	40	134
Improved.....	126	28	154	22	9	31	185
Unimproved.....	165	47	212	25	2	27	239
Total discharged.....	378	103	481	66	35	101	582
Died.....	91	83	174	58	46	104	278
Total of patients discharged and died..	469	186	655	124	81	205	860
Number of patients remaining on rolls June 30, 1933.....	2,625	753	3,378	954	649	1,603	4,981

ADMINISTRATIVE DEPARTMENT

Supplies.—The supplies produced on the hospital reservation, including farm and garden products, shoes, brooms, articles made in the sewing and mending rooms, output of the bakery, laundry, power, heat, and lighting plant, mattress shop, etc., were valued at about \$775,000 during the year 1933, slightly less than during the previous year, due to the reduced prices both commercially and on account of reduction in salaries entering into the manufactured articles. Included in this amount were 290,000 gallons of milk, 23,000 gallons of ice cream, 14,500 dozen eggs, 4,550 pounds of chicken, 150,500 pounds of fresh pork, 939 bushels of tomatoes, 921,000 loaves of bread, 3,297,000 rolls, 48,000 pounds of pastry, 9,900,000 pieces of laundry, 5,900 brooms, 3,500 brushes, 2,387 mattresses, 2,153 pillows, 14,500 pairs of shoes and slippers; in addition, large quantities of farm and garden supplies, items of clothing, silage, steam, electricity, water, ice, and refrigeration, and many smaller items.

Diet.—The hospital continues the study of the diet. Not only is a greater variety of food being served to the patients and a larger variety of greens continued throughout the year but, also, efforts have been made to see that the food is served in a more appetizing manner. The general kitchen has been equipped with 10 sections of gas ranges and 2 gas baking ovens. These replace the old worn-out coal-heated ranges and ovens. A cafeteria has been equipped adjacent to the general kitchen and is used for the patients from several of the wards of the center building. Classes in dietetics for the student nurses were taught by two of the dietitians. These classes consisted of 22 hours of lecture work and 22 hours of laboratory work. Fifteen hours of lectures for the student nurses, on diet and disease, were given by one of the dietitians. The dietitians visit the dining rooms in each service at meal times; at this time complaints made by patients are immediately given attention.

Laundry.—The work of the laundry continues to increase. The number of pieces laundered during the past year was 9,900,000, about 1,500,000 increase over the previous year. Notwithstanding this increase, during the year there has not been an increase among the paid employees, there being two vacancies that have not been filled. Two presses and six double-sleeve ironers have been added to the equipment in order to meet the increased production. At the end of the year the work of the linen-exchange room was combined with the laundry, the forewoman in charge of the exchange room having retired.

Shoe shop.—Work in the shoe shop furnished employment to about 35 patients for about 5½ hours each day, except Saturdays and recreation days. During the past year there were manufactured in this

shop 6,624 pairs of house slippers; 3,189 pairs of men's oxfords, and 2,851 pairs of men's other shoes; 794 pairs of women's oxfords, and 1,012 pairs of women's strap slippers. There were 2,717 pairs of shoes repaired. In addition to that, in the same shop, there made 3,500 brushes of all classes.

Lawns and grounds.—The construction of new buildings, rearranging of roads, changing of elevations, and building of tunnels will result in completely changing the lawns and grounds and the general landscaping of the institution. Where there was formerly level ground there are now terraces; on what was formerly farm land, buildings have been erected. This will result in new lawns around these buildings and new walks and roads approaching same. It is necessary to sod and plant the lawns, lay out flower plots, plants, foliage and trees, and hedges, where feasible. Some small trees are in the nursery, and it is hoped to set out over 200 trees during the winter of 1933-34. Approximately 750 feet of new fencing was put up on the south boundary of the cemetery. New ground has been laid out to take care of the increased number of patients who are buried at the hospital.

Fires.—There were 11 small fires during the past year with approximate damage of \$805. From July 1, 1917, to June 30, 1933, the total loss from fire at the hospital was approximately \$4,042, an average of about \$250 a year. Fire extinguishers have been installed in the new continuous treatment buildings and tuberculosis building, and 15 replaced throughout the center building basement. During the year regular inspections have been made of fire hydrants, stairways, fire escapes, basements, hose closets, and attics, and where repairs were needed they were made. Six hundred and twenty-five soda fire extinguishers are regularly inspected and repaired, and once a year all extinguishers are refilled. The 155 Pyrene-type extinguishers are inspected, repaired, and refilled if needed. The fire siren is tested monthly, also the fire-alarm system. The fire pumps at the power house are tested weekly. The triple combination pumper is tested daily and put in service once a week. Tests are made of all fire hose once a year. Fire drills are held monthly, and weekly inspections are made with officers and privates of the District of Columbia Fire Department present.

Disbursements.—The total amount of money disbursed by the hospital from various appropriations and trust funds during the year was \$3,827,000. The total collections, including reimbursements to the regular appropriations, personal funds of patients, and pension trust funds, were \$2,551,000.

Supplies.—Orders were placed for supplies during the year amounting to \$1,441,000. Of this amount, \$830,000 was covered by formal contracts entered into by the hospital directly with the contracting

parties. These formal contracts entered into by the hospital included the male receiving building and furnishings for the continuous treatment buildings. There were 256 open-market contracts entered into by the hospital.

Personnel.—The total number of employees on the hospital rolls June 30, 1933, was 1,507, of which 1,414 were permanent employees and 93 temporary employees, there being a decrease in the permanent force of 52 and a decrease in the temporary force of 10, or a total of 62.

During the year legislation was enacted putting into effect what was known as the "legislative furlough", in accordance with which each employee had 2½ days' pay deducted each month and was permitted to take 2 days' vacation for the same period. Additional legislation was enacted terminating the legislative furlough at the end of March 1933 and in lieu thereof directing that 15 percent should be deducted from each employee's salary and the employee should be permitted to have not exceeding 15 days' vacation each year, said vacation being cumulative, such part as is not taken during one year to be placed to the credit of the employee, who could have the additional time off the following year or years.

The limitation on the filling of vacancies was continued and legislation was enacted directing that in reducing personnel such employees who had served the Government for a period of 30 years would be permitted to retire under the retirement act, if their services were no longer required. The legislative bill of 1933 pertaining to married employees was continued in force.

New construction.—The new tuberculosis building for 80 patients, completed at the close of the fiscal year 1932, was completely equipped and occupied.

The two continuous treatment buildings nos. 1 and 2, dining hall and kitchen building, were completed, equipped, and occupied during the early months of the year. These buildings are provided with many improvements over former buildings. They are 2-story buildings containing about 160 beds each, with large day-rooms and porches. In continuous treatment building no. 1, temporarily occupied as a male-receiving building, the basement contains a hydrotherapy department, occupational therapy outfit, and barber shop.

The kitchen in the continuous treatment buildings was built large enough to cook for about 1,600 patients. Only half of the equipment is installed at the present time. This kitchen contains the most modern up-to-date equipment of the various classes—gas ranges, electric ovens, and other equipment—has refrigerating rooms on the main floor as well as in the basement, adequate storing space, and the necessary utilities.

Plans and specifications for the male-receiving building were completed, advertisements placed, and an award made for the construction of this building. Its construction is now under way, and it is approximately 50 percent completed as of June 30, 1933. This building will have facilities for 400 patients and the necessary equipment for a male-receiving building.

RECREATIONAL, VOCATIONAL, AND OCCUPATIONAL WORK

Occupational therapy.—During the year this department furnished occupation for 964 patients, slightly less than during the previous year. This work included weaving, sewing, toy-making, woodwork, basketry, etc. In the industrial department there were made 27,772 sheets, 9,430 pillow cases, 14,277 towels, 2,626 dresses. The woven articles consisted of 6,868 bath towels, 227 dresser scarfs, 1,200 rugs, and numerous other items, totaling 68,789, with an approximate value of \$25,156. Many of the articles made by these patients are for general use in the hospital, such as bed linens, dresses, etc.

Red Cross.—The Red Cross continued to maintain a hospital unit during the past fiscal year, consisting of 3 psychiatric social workers, one of whom is the field director, 3 recreation workers, and 3 secretaries. The psychiatric social workers are primarily concerned in case correspondence, and contact work. During the past year that office sent out 2,676 and received 3,667 letters concerning patients and their affairs. The letters and reports primarily were to secure psychiatric histories and to verify facts furnished by patients and relatives; to make previsit or predischARGE investigations; to secure reports of the adjustment of patients on visit outside the District of Columbia; to secure information about and to effect the adjustment of financial problems in the patients' homes which might have been connected with or incidental to the patients' mental breakdown; to contact the local Red Cross chapters in the towns in which the patients' families live, so that they can take care of any social problems which may exist in the patients' homes; to locate missing relatives of patients; to establish patients' legal residences; to see that the children and wives, resident outside the District of Columbia, may have blood tests when advisable; to have patients' families visited by a social worker with a view to explaining the advantages of having unrecovered patients remain in the hospital when they are requesting discharge. Assistance is given to patients when it is for their benefit and they are visited in the wards and efforts made to see that they are furnished with magazines, books, tobacco, etc.

It seems that during the past year there were an unusual number of cases where emotionally upset patients had received distressing letters from people at home. Efforts in every case were made to contact

some local representative of the Red Cross, or others, to visit these homes in an attempt to relieve the condition at home, and in this manner relieve the unpleasant contact with patients. The psychiatric case work staff has continued filing pensions and the referring of other types of claims to the proper authorities for action. During the past year Red Cross representatives participated in the handling of 332 Government claims.

Tickets of all classes amounting to 3,428 were donated for the use of patients, 100 more than during the previous year. These tickets covered the Coast Guard and Marine football games, the American League baseball games, and the weekly shows at the Earle Theater. During the year there were 90 moving-picture shows in Hitchcock Hall on the hospital reservation. The Red Cross has supervised and arranged 171 general parties and entertainments, exclusive of dances and band concerts on the lawn. They have supervised and arranged 198 ward events, including occasional moving picture shows in Howard Hall and retreat wards. The athletic director has organized, supervised, and participated in 76 athletic events. The Red Cross House is kept open every day in the year. On Sundays and holidays it is open from 10 o'clock in the morning until 8 o'clock in the evening. The daily population visiting this house ranges from 750 to 800 patients.

Patients' library.—The total number of volumes in the patients' library is now 15,800. Seven hundred and fifty books were bound and repaired. Six newspapers (daily and Sunday) are subscribed for, as well as 19 popular magazines. Five thousand five hundred magazines, mostly surplus received from the Library of Congress, were distributed to the wards. Approximately 150 books were issued daily, and the number in constant circulation was about 3,500. The number of patients interested in the library work varied from time to time, the maximum number being about 25 patients employed in various capacities in the library and in the bindery.

MEDICAL DEPARTMENT

Social-service department.—The work of this department during the past year included training of students from the hospital training school and from the social-service school.

The social-service report from July 1, 1932, to June 30, 1933, showed the following:

Number of out-patients on rolls July 1, 1932.....	167
Number of out-patients on rolls June 30, 1933.....	149
Average number on rolls per month.....	160
Number of patients discharged from the hospital.....	80
Number of out-patients under care during the year.....	238
Interviews at the hospital pertaining to this work.....	647
Number of visits made in regard to this work.....	2,789

Training school.—Forty-two students graduated in the nurse and psychiatric-aide class during the year—20 graduates from the nurse class and 22 from the psychiatric-aide class. This was the largest graduating class in the history of the hospital's training school. The total number of students on the rolls July 1, 1932, in the senior class was 32, 3 of whom separated from the service, leaving a senior class of 29 who graduated. The junior class consisted of 32, of whom 10 were separated due to various causes, leaving 22 enrolled at the end of the year. On September 1, 1932, 39 students were admitted to the freshman class, of whom 18 were separated from the hospital, leaving 21 in this class. On July 1, 1932, there were 17 affiliate students and 8 postgraduates enrolled in the hospital. There have been 71 postgraduates enrolled since that period. Fifty-seven separated or completed their enrollment, leaving 38 on the rolls. Since July 1, 1932, 103 affiliates have been enrolled, 80 of whom completed the course, 2 were transferred back to their home schools, and 21 remained on the rolls. Thirty attendants began class work October 1, completing the course March 31. Twenty-three employees enrolled for the course given psychiatric aides and 22 are still enrolled. It has been decided not to admit a class in the fall of 1933.

Medical and surgical wards.—During the past year there have been admitted to the service 1,881 cases. Of these 1,611 were admitted to the medical and surgical wards, 252 to R Building, and 18 to Isolation Building. There were admitted to the various dispensary activities of the service 16,450 patients, who received 35,215 treatments.

During the year the use of quartan malaria was added to that of benign tertian malaria in the treatment of paresis. The quartan malaria seems to possess the advantage of a greater percentage of takes, a more persistent continuation of the paroxysms, and more consistently high temperatures and is more successful with the colored patients who are so frequently immune to inoculation with the colored strain. Furthermore, it has been easier to carry the strain along. The strain was obtained early in the fall and is still available. The attacks of malaria produced by the quartan parasite are just as easily controlled as those produced by the tertian type.

During the year the medical and surgical service received an inspection by the director of the hospital section of the American College of Surgeons and his assistant. As a result of this inspection the medical and surgical service was awarded the approval of the College of Surgeons and a certificate of that approval now hangs in the lobby of the medical and surgical building. One of the features instituted in the service in connection with the American College of Surgeons, requirements is a weekly clinical meeting of the staff at which cases are presented by the internes. This meeting occurs every Saturday morning. Generally two cases are presented. They are

thoroughly worked up beforehand and presented concisely and briefly in all their aspects. Following this presentation the cases are discussed by various members of the staff, criticisms being made and constructive suggestions offered. These meetings have proved to be very desirable stimulants to the internes' initiative and activity. These meetings are attended by the entire medical and dental personnel of the service and visits have been made by other members of the staff and by some outside practicing physicians.

Basal metabolism tests have been added to the routine admission procedures in cases of functional psychoses, and use of the sedimentation test has been discontinued. The Oaks hydrotherapy department gave 35,099 treatments during the year. In the C hydrotherapy room there were 34,218 treatments for the year, a total treatment average of 69,317 in the women's department. Occupational therapy classes are held in Toner and L Buildings all day, and in K and J Buildings half days. Classes are held in C and Q Buildings all day, and half days in M and N Buildings.

Psychotherapy.—A monthly average of 17 selected patients were afforded psychotherapy. With a few exceptions all admission conferences on the male services have been conducted by the clinical psychiatrist, who has tried, in addition, as far as possible to utilize the material for the instruction of attending internes. The admission conferences on the female services have been attended regularly and have been occasionally conducted by the clinical psychiatrist. Psychometric tests and personality studies have been made, numbering 146. Special mental examinations for psychiatric opinions have numbered 312. Hours of consultation on cases from other Government departments referred to the clinical psychiatrist numbered 56.

Laboratory.—The work of the laboratory has increased in nearly all respects, chiefly through greater diversification. This is particularly notable in the department of chemistry, including electrocardiography. The feature of training the internes in laboratory work has increased their efficiency in intelligently requesting examinations. Major changes in the set-up of the laboratory consist in enlargement of the chemistry department and the transformation of the old X-ray department into an excellent serologic laboratory. The doctor in charge of the chemistry department resigned in order to take a place in the Department of Biochemistry at Duke University. The work of the individual departments is summarized as follows:

Pathology.—Each Tuesday clinicopathologic conferences are held upon the cases coming to necropsy during the preceding week. At this time the diseased organs are demonstrated, and microscopic sections are presented by means of a projector. This conference is attended by the medical and surgical staffs, and is considered of

much value. The autopsy percentage has been maintained at a high level by the efficiency and interest of the medical staff. One hundred and ninety-two autopsies have been performed, the largest number since 1925.

Neurology.—Neurologic examinations are now established as part of the laboratory procedure, all new admissions with positive serology, all over 60 years of age, and all with suspected organic disease of the brain being submitted. The internes have worked diligently and effectively at this phase of the service.

Serology.—The study of colloidal gold promises to be an outstanding contribution from this laboratory. The progressive improvement of the gold reaction in treated paretics has been studiously observed over the past several years, and its prognostic value is considered notable.

Research.—Continuation of the work on catatonic patients is reported. Some very striking phenomena have been observed and occasional improvements are lasting. During the past year a grant from the Josiah Macy, Jr., Foundation to the Department of Neurology, George Washington University, has made possible a statistical study of the biometrical material that has been collected during the past 9 years at St. Elizabeths Hospital. This work has been done in conjunction with the department of biology, Johns Hopkins University. Owing to financial stringency the continuation of this work has been interrupted, but significant data upon the endocrine glands in relation to the psychoses are expected to be forthcoming.

NEEDS OF THE HOSPITAL

An estimate of \$1,182,600 for the support, clothing, and treatment of the patients in St. Elizabeths Hospital for the fiscal year ending June 30, 1935, was recommended. This amount was based on 1,800 patients. The hospital at the present time has 4,981 patients. The average for the fiscal year 1933 was 5,036, as compared with 4,798 the previous year, an increase of 238. The average for the fiscal year 1935, it is estimated, will be 5,418, which will be 437 more than the present number. The 5,418 are divided as follows: 1,800 Federal patients, appropriated under the title of St. Elizabeths Hospital in the Interior appropriation act; 3,200 beneficiaries of the District of Columbia, and appropriated for in the District of Columbia appropriation act; 160 beneficiaries of the United States Veterans' Administration, and carried in its appropriation; 122 beneficiaries of the United States Public Health Service, and provided for in the appropriation for Treasury Department, under Public Health Service; 36 beneficiaries of United States Soldiers' Home, and payment for these to be received from that service. There is a new item of 100 estimated to be received from the Indian hospital and from

Indian reservations, and which will be chargeable to Bureau of Indian Affairs (conservation of health among Indians).

Legislation has so changed the conditions under which patients are committed to St. Elizabeths Hospital and the manner in which some of its funds are received that it is difficult to use precedents as a basis of the future needs. The act of March 20, 1933, practically repealed all laws governing the admission of service patients to St. Elizabeths Hospital, and the payments of funds due in the way of compensation, pension, etc., to the inmates of the hospital. This not only may affect the number of admissions, but it resulted in the transfer of a number of the beneficiaries of the United States Veterans' Administration from St. Elizabeths Hospital to hospitals and institutions of the Veterans' Administration. Similar action has been taken in reference to hospitals of the Army and Navy, and by transferring patients from those hospitals to Veterans' Administration hospitals left vacant beds in such hospitals, some of which may be filled by retaining mental cases which otherwise would be sent to St. Elizabeths Hospital.

The changing of the method of sending funds to the hospital affects, particularly, such funds commonly known as "pension moneys" received by the Superintendent under the acts of February 20, 1905, and February 2, 1909. Under the said acts all pensions of inmates of St. Elizabeths Hospital were sent to the hospital in the name of the Superintendent, who deposited the same directly, or through the disbursing officer of the hospital, in the Treasury of the United States under the account of Pension Money, Trust Funds. Accounts were opened with each patient, one sixth of all money being placed to his benefit on the books for his sole use. Of the balance a certain part would go to any dependent relatives, and if after paying their share any further balance remained would be used for reimbursing the hospital for any expenditure for the care and maintenance of the patient. In case of no dependent relative, the balance, after deducting one sixth, would be used to reimburse the hospital for the payment of care and maintenance. Should any moneys received for such pensioners be from the class that could be considered beneficiaries of the United States Soldiers' Home or indigents of the District of Columbia, those sources would receive credit for the accounts received from the individuals from their pensions when rendering monthly board bills. Thus this change in law will affect to some extent the amount to be paid to the hospital by the District of Columbia and the United States Soldiers' Home.

The hospital authorized for the Prison Bureau of the Department of Justice, at Springfield, Mo., has just been completed, and St. Elizabeths Hospital has been notified that the Department of Justice would remove about 31 patients and transfer them to its hospital at

Springfield. This will result in some reduction in the number of patients in the hospital. On the other hand, the hospital has been advised by the Commissioner of Indian Affairs that the Secretary of the Interior has ordered the transfer of approximately 100 Indians from the Canton Asylum for Indians at Canton, S.Dak., to St. Elizabeths Hospital. The hospital at Canton, S.Dak., will be closed and the Indians—who are wards of the United States Government—who hereafter will require mental treatment will be sent to St. Elizabeths Hospital for such treatment. If the Commissioner should complete this transfer, arrangements would have to be made for taking care of 100 additional patients, probably to be chargeable to the appropriation of the Indian Bureau.

The rate estimated for the care of patients during 1935 is \$1.80 per capita per day. This includes the basic salary without the 15 percent deduction at present in effect, and a slight increase on account of higher prices. At the present time the rates of food supplies, forage, textiles, etc., seem to be on the up grade. The effect of the N.R.A. action in providing codes for all industries seems to have a tendency to increase the cost of various items, and part of the estimated increase will be required for this purpose.

Included in the estimate is \$200,000 that is essential to keep up the repairs and necessary improvements to buildings and grounds. This is the same amount as authorized for 1933 and 1934. Out of these repairs will come the funds for keeping approximately 100 buildings in repair, repairing and widening some of the roads, the maintenance of the railroad track, various outbuildings, etc.

REVISION OF LAWS FOR ADMISSION OF PATIENTS TO ST. ELIZABETHS HOSPITAL

A bill was introduced in the House of Representatives and in the Senate of the United States to change the method of admissions to St. Elizabeths Hospital. The main changes from the existing legislation were:

Provision for voluntary commitment for treatment, on request of patients, with provision for discharge on 3 days' notice. Provision that insane persons taken into custody by the police or other officials shall not be subjected to trials as are criminals, but may be held in the hospital and treated, and not tried except upon their requests or requests of their relatives, guardians, or friends. If a trial is demanded by an insane person, his guardian, or friends, or by court, upon petition, the insane person shall be heard by the court, and not subjected to trial by jury unless the insane person, his relatives, guardian, or friends demand it.

Temporary commitment or detention is provided for, with provision that during such temporary commitment, and prior to formal commitment, the person may be released upon certificate to the

District of Columbia by the superintendent of the hospital or by two physicians in regular attendance at any other hospital where the patient may be detained, that the person is not insane or has recovered his or her reason.

Provision for the automatic restoration of the civil rights of patients discharged from the hospital on certificate of the superintendent that they are cured or that further treatment is unnecessary or undesirable.

The proposed legislation recommended, it is believed, would for the most part make unnecessary writs of habeas corpus and would make the release of patients to those competent to care for them simpler, and it would be in keeping with previous attempts to secure legislation amendatory of those portions of the District Code which deal with the admission, detention, and release of patients in the Government Hospital for the Insane (St. Elizabeths Hospital).

In the report of the Comptroller General of the United States (H.Doc. 605, 69th Cong., 2d sess.), suggestion is made that additional legislation on this subject is desirable.

A committee of medical advisers which made a survey of the hospital under the direction of the Secretary of the Interior made a number of recommendations for remedial legislation, but did not undertake to draft a measure for this purpose. The design of the bill suggested was to provide a method more in keeping with the modern humanitarian and medical attitude toward this class of patients, and along lines which have proved effective in several of the States and in other countries. Provision for emergency commitment is included. Authority is given the superintendent to consider paroling of patients as a therapeutic measure, and to permit the return of patients to their homes under the supervision of the hospital.

There was a hearing before a subcommittee of the District of Columbia Committee of the House of Representatives during a previous year. There were present at this hearing representatives of the hospital and a representative of the corporation counsel of the District of Columbia in favor of the bill, and two parties, a man and a woman, opposed to it.

As a result of this hearing we are more than ever of the opinion that the laws pertaining to the admission and treatment of the patients at St. Elizabeths Hospital should be revised, but we believe that the initiative should be taken by representatives of the District Government; and the Interior Department, through representatives of the hospital, should cooperate with the District authorities in securing the enactment of the proposed bill into a law. The District is primarily interested in such legislation, as it affects the welfare of its residents, and we believe if the initiative is taken by them heartier cooperation would result and the bill perhaps would receive better consideration.

HOWARD UNIVERSITY

(MORDECAI W. JOHNSON, S.T.M., D.D., President)

The year 1932-33 was the second of the 10 years involved in the program of development approved by the Government. During this year the university suffered heavily from the depression. Enrollment fell 571 below 1931-32. The university also suffered loss in income from the Government and from private sources. Heavy curtailments of planned expenditures were made in materials and supplies and in educational and scientific equipment. Teachers' salaries were reduced. At length, also, reductions in teaching personnel became imperative. In spite of the difficulties, however, the budget was kept at balance, with a surplus accruing at the end of the year, and the percentage relation between Government and private funds was maintained at the balance provided for in the agreed-upon program of development.

The university continued to receive help from the General Education Board and the Julius Rosenwald Fund for the development of the libraries, the further improvement of the teaching staff through fellowships, for research in zoology, for the extension of university grounds, and for teachers' salaries, although most of the latter could not be used on account of loss in the supporting structure of current funds.

The teaching staff of the university, strengthened by 3 years of far-sighted Government help, was numerically adequate for the student body for the first time since the university abolished its secondary division in 1919, although this adequacy was not equally distributed throughout the university and the number of mature teachers in the professorial rank was still less than half the number required for an adequate teaching staff. The teachers continued their eager self-improvement, fully one eighth of the entire full-time number being away on leave for further study during the year.

The area of research was expanded, especially in the biological sciences, and scholarly publications continued. The *Journal of Negro Education*, established 1 year ago, was widely welcomed as an educational organ of national significance.

Though current funds were reduced, there was substantial improvement in educational and scientific equipment and in the libraries. Through the use of emergency construction funds, made available by the Government, the entire south end of the main university campus was graded for use as a science quadrangle, terraced, sodded, finished, and otherwise beautified. The heat, light, and power tunnel, pro-

vided by the Government, was also completed. Plans for the chemistry and classroom buildings were finished and substantial progress had been made on the plans for the library and the heat, light, and power plant.

Important actions were taken by the board of trustees looking toward the improvement of the university. Trustee bylaws were revised and simplified. Trustee committees were limited in number and their functions redefined. The university financial system was thoroughly surveyed by experts in educational finance. The offices of secretary and treasurer, hitherto united in the office of secretary-treasurer, were separated. Publications, publicity, and promotion were merged with the secretarial duties of the board of trustees and of the university, in one office, while a new treasurer was elected and all financial and business administration was concentrated in his office. The accounting system was reorganized on the basis agreed upon by the American Association of Universities and the American Association of Colleges.

The educational organization of the university was thoroughly surveyed by experts from Columbia University and a consequent simplification of organization was voted by the trustees on the basis of this and other studies as follows: All undergraduate studies to be combined in one undergraduate college of liberal arts, beginning 1933-34; a graduate school to be organized in 1934-35, with a separate dean; engineering branches and architecture to be discontinued at the end of 1933-34 and committees appointed to study the adjustment of other applied-science divisions, education and music, to the undergraduate and graduate units; the position of university architect to be discontinued at June 30, 1933, and architectural services to be related to future buildings as and when appropriations are made; the semester system to be established throughout the university 1933-34; the summer school to be discontinued; the theological college, evening school, and correspondence courses in religion to be discontinued, and the school of religion established on a graduate basis beginning 1933-34.

During the year three needs of the university emerged as primary and urgent. First, the need for advancing the maturity of the teaching staff by increasing the number of competent teachers in the professorial rank. Secondly, the need for a library building, with an enlarged staff and a substantial increase in the number of books. Thirdly, the urgent need for large increases in the amount of money available for student scholarships and fellowships.

REGISTRATION

The following table shows the net total enrollment at Howard University during the school year 1932-33, including summer, autumn, winter, and spring quarters, and excluding duplicates, as compared with 1931-32.

Summary of students enrolled in Howard University for the years 1932-33 and 1931-32

Divisions of the university	Net enrollments						Total gain	Total loss
	1932-33			1931-32				
	Total	Men	Women	Total	Men	Women		
<i>The colleges</i>								
College of liberal arts.....	540	375	165	678	480	198	-----	138
College of education.....	523	113	410	746	163	583	-----	223
College of applied science.....	77	50	27	68	35	33	9	-----
School of music.....	41	16	25	61	22	39	-----	20
Graduate division.....	170	83	87	194	80	114	-----	24
Total.....	1,351	637	714	1,747	780	967	9	405
<i>Professional schools</i>								
Theological college.....	40	32	8	39	33	6	1	-----
Graduate school of theology.....	10	10	-----	5	5	-----	5	-----
Law school.....	44	44	-----	61	61	-----	-----	17
School of medicine:								
College of medicine.....	206	200	6	221	215	6	-----	15
College of dentistry.....	38	37	1	52	49	3	-----	14
College of pharmacy.....	24	22	2	33	28	5	-----	9
Total in professional schools.....	362	345	17	411	391	20	6	55
Total in regular courses.....	1,713	982	731	2,158	1,171	987	15	460
Special students in music, religion, law, dentistry.....	96	30	66	24	12	12	72	-----
Correspondence students, religion.....	84	82	2	282	281	1	-----	198
Total special students.....	180	112	68	306	293	13	72	198
Grand total (net).....	1,893	1,094	799	2,464	1,464	1,000	87	¹ 658

¹ Net loss 571.

This table shows that the total enrollment for 1932-33 was 1,893 students, of whom 1,094 were men and 799 were women, as compared with the total of 2,464 for 1931-32, of whom 1,464 were men and 1,000 were women. A net loss of 571 students, or 23 percent, is indicated. The heaviest losses (372) are indicated in the undergraduate divisions, where the college of education led with a total loss of 223, or 30 percent. The degree students of applied science, however, proved an exception, showing a gain of 9.

The graduate division showed a loss for the first time since its organization, though the total percentage of loss in this division (12 percent) was little more than half the prevailing percentage of loss in the university as a whole. The professional school showed a loss of 49 students, or only 12 percent. In medicine, the losses were slight in number and percentage, while the theological college and the graduate school of religion registered gains of 1 and 5, respectively.

When it is considered that Negro students and their parents constitute the poorest tenth of the American population, being the first to suffer from depression and generally the last to recover, this decline in enrollment at Howard University must be considered remarkably small.

There is ample evidence, however, that many students are remaining in school under the severest strain. The university is making every possible effort to help students by increasing the number of small scholarship grants and work opportunities, awarded on the basis of high scholastic standing accompanied by manifest need. Resources for such relief, however, are painfully limited. There is no possibility of rendering help to more than a small percentage of even the most deserving.

Geographical distribution.—Forty States sent 1,590 candidates for degrees to Howard University in 1932-33 as compared with 42 States sending 2,015 candidates for degrees in 1931-32. It is to be said that 25 States sent 10 or more candidates for degrees to the university during both these years. Seventeen foreign countries sent 123 candidates for degrees to Howard University during the school year 1932-33 as compared with 16 foreign countries with a total of 143 candidates for degrees in 1931-32.

GRADUATES

In 1932-33, a total of 319 students were graduated, as compared with 361 in 1931-32, a decrease of 42. The divisions of liberal arts, education, law, and medicine shared these losses. Increases in the number of graduates are shown in the college of applied science, the school of music, the graduate division, the theological school, the college of dentistry, and the college of pharmacy.

Summary of students graduated by Howard University for the years 1932-33 and 1931-32

Divisions of the university	Graduates						Total gain	Total loss
	1932-33			1931-32				
	Total	Men	Women	Total	Men	Women		
<i>The colleges</i>								
College of liberal arts.....	64	44	20	96	75	21	-----	31
College of education.....	122	25	97	131	22	109	-----	11
College of applied science.....	7	3	4	6	5	1	2	-----
School of music.....	4	1	3	3	0	3	1	-----
Graduate division.....	34	17	17	18	11	7	16	-----
Total.....	231	90	141	254	113	141	19	42
<i>Professional schools</i>								
Theological college.....	10	6	4	8	8	-----	2	-----
Graduate school of theology.....	-----	-----	-----	-----	-----	-----	-----	-----
Law school.....	8	8	-----	18	18	-----	-----	10
School of medicine:	-----	-----	-----	-----	-----	-----	-----	-----
College of medicine.....	42	42	-----	55	53	2	-----	13
College of dentistry.....	18	17	1	17	17	0	1	-----
College of pharmacy.....	10	9	1	9	6	3	1	-----
Total in professional schools.....	88	82	6	107	102	5	4	23
Grand total (net).....	319	172	147	361	215	146	23	165

¹ Net loss, 42.

Of the 34 who received degrees from the graduate division, 23 were awarded the degree of master of arts, while 11 received the degree of master of science.

Of the 64 graduates in liberal arts, 41 received the degree of bachelor of arts, 19 the degree of bachelor of science, and 4 the degree of bachelor of science in commerce. Of the 122 graduates in the college of education, 96 received the degree of bachelor of arts in education and 26 the degree of bachelor of science in education. Of the 7 graduates in applied science, 1 received the degree of bachelor of science in architecture, 1 in civil engineering, 1 the degree of bachelor of science in electrical engineering, and 4 the degree of bachelor of science in home economics. Four graduates received the degree of bachelor of music.

In the professional schools, 42 graduates received the degree of doctor of medicine and 18 the degree of doctor of dental surgery. Of the 10 who received degrees in pharmacy, 3 received the degree of bachelor of science in pharmacy and 7 the degree of pharmaceutical chemist. In the school of law, 8 degrees of bachelor of laws were awarded.

Honorary degrees.—One honorary degree of doctor of laws was conferred, the recipient being Oswald Garrison Villard, editor of *The Nation*.

TEACHING STAFF

1. *Number of teachers.*—There were 265 members on the teaching staff during the year 1932–33, of whom 153 were on full time and 122 were on part time, representing together a full-time equivalent of 174½ teachers. This represents a reduction of 16 in the faculty as compared with 1931–32, made necessary by decreasing enrollments and reduced financial income. These reductions were distributed over the following colleges: Liberal arts, education, applied science, music, law, and dentistry.

2. *Teaching hours, class size, and class-hour loads.*—In the professional schools and colleges there were no marked changes in hours of teaching with the exception of the preclinical branches of medicine where teaching hours were increased on account of the necessary subdivision of classes.

By reason of the decreased enrollment in dentistry, pharmacy, and law, class sizes showed a reduction for the professional group, with a corresponding increase in the number of teachers carrying clock-hour loads below 300.

In the undergraduate and graduate divisions where loss in enrollment was accompanied by reduction in the number of teachers, there was a shift of 14 teachers from the groups rendering 1 to 15 hours of service per week to the groups rendering from 16 to 30 hours of service per week. Class size, however, showed a decided shift from

the group of classes ranging from 16 to 50 students in number toward the groups ranging from 1 to 15 in number. Clock-hour loads ranging from 1 to 200 showed a gain of only 5, however. The loss of 13 teachers from the groups ranging from 201 to 500 clock hours was due, in part, to the reductions in staff made by the board of trustees.

3. *Improvement of staff.*—The teachers continued their work of self-improvement through further study. During the year, 25 of them continued study at other universities. Twenty-two of this number were on leave of absence for the purpose. Four of these earned the doctor's degree and returned to the staff. There were 6 important appointments, which strengthened the intellectual standing and maturity of the staff.

Of the 22 teachers on leave of absence and on scholarships for further study, 12 were from the college of liberal arts, 2 from education, 3 from applied science, 1 from music, 2 from law, and 2 from medicine. The university is deeply indebted to the Rockefeller Foundation and the General Education Board for funds which have made much of this study possible, and to the Julius Rosenwald Fund for annual assistance.

4. *Maturity of the staff.*—While during the current year it became apparent that the faculty of Howard University was for the first time numerically adequate for the student body, it was all the more clear that by reason of the limited number of teachers in the professorial rank this staff had not yet passed the half-way mark toward maturity. Of the 175 teachers (exactly $174\frac{1}{2}$ full time and full-time equivalent) at Howard University during the school year 1932-33, only 34, or 19 percent, were in the professorial rank; 26, or 15 percent, were in the associate professorial rank; 33, or 19 percent, in the assistant professorial rank; while 82, or 47 percent, were in the instructors' rank and below. On the basis of the 10-year program of development which calls for a percentage distribution in the four leading ranks of 40%-10%-20%-30%, the present staff (full time and full-time equivalent) should have a distribution as follows: 70 professors, $17\frac{1}{2}$ associate professors, 35 assistant professors, $52\frac{1}{2}$ instructors. On the quantitative basis alone it appears that the university has yet more than half way to go in the development of an able staff of mature professors. An examination of university salaries confirms this judgment. The university is spending approximately \$175,000 less in salaries than would be necessary to obtain and hold the services of a sufficient number of mature professors at the salary scale planned in the 10-year program. The securing of 36 mature capable scholars for important positions on the professorial staff of the university is the outstanding educational need. All other improvements are subsidiary to and wait upon this for their fullest effectiveness.

5. *Salaries of teachers.*—The salaries of the teaching force, administrative staff, and employees of the university during the school year 1932–33 were cut by percentages of 8% and 6% successively. This was an especially hard burden for the teachers to bear, for in all of the four ranks of instruction the average salary, before the cuts were made, was still far below the normal average set forth in the 10-year program of development. The university is mindful of the fact that prompt curtailment in the number of teachers on educational and financial grounds increases all the more the obligation to afford adequate salaries for those who remain on the staff. With the return of normal conditions, it is the purpose of the trustees to move toward the averages set up in the 10-year program as swiftly as the resources of the university will permit.

GRADUATE DIVISION

1. *Student enrollment.*—During the year 1932–33, there were 170 graduates in residence in Howard University, including 83 men and 87 women, 141 of whom were registered as pursuing graduate degrees in 18 departments, as shown in table 6. The registrants for advanced degrees showed a decrease of 16 as compared with the school year 1931–32, but the percentage reduction of 13 was much less than the general decrease in student attendance throughout the entire university (about 23 percent). In spite of this decrease in enrollment, incident to distressing economic conditions, the total enrollment of 141 was 1 student in excess of the enrollment of 140 planned in the 10-year program for the graduate division during the year 1932–33.

2. *Degrees awarded.*—The number of students who received advanced degrees in 1932–33 was 34, as compared with 18 in 1931–32 and 13 in the year 1929–30, the highest preceding peak years. Of the 34 graduate degrees awarded, 23 were masters of arts, awarded to 9 men and 14 women, and 11 were masters of science, awarded to 7 men and 4 women. Ten of the degrees were awarded in education, 4 in French, 6 in English, 3 in history, 3 in mathematics, 2 in chemistry, 3 in psychology, 1 in physics, and 2 in zoology.

3. *Teaching staff.*—The teaching staff of the graduate division during 1932–33 included 48 members as compared with 49 in the year 1931–32. Of this number, 39 were from the faculty of the college of liberal arts, 7 from the faculty of education, and 2 from the faculty of the school of religion.

4. *Research and publication.*—With the aid of the Julius Rosenwald fund, research in zoology was continued, this being the last of 5 years, under the grant of \$15,000 for the purpose. Grants to Associate Professor Harris and Assistant Professor Lewis, in the depart-

ment of economics, enabled them to continue their projects in this field. Three members of the college of education engaged in four research projects. Four members of the faculty of medicine engaged in significant research. One member of the faculty of dentistry undertook research in pathology.

During the school year members of the university teaching staff published 57 scholarly articles and 2 books.

5. *Future of graduate work.*—The 6-year experiment with a graduate division at Howard University, under the control of a committee of instruction appointed by the president from the several faculties of the university, has proved that the project to develop graduate work at the university is soundly based on a real and growing need. Enrollment has steadily increased and in spite of the depression, has passed the point of growth planned for normal years. The number of degrees has increased from 3 to 34.

Increased resources of the university have made available a steadily advancing number of competent teachers with time available for careful attention to the individual student and to the pursuit of independent reflection and research. At the end of the school year 1933-34, the experimental period will end and the university will formally organize a graduate school under a separate dean. This forward step was provided by the unanimous passage of the following recommendation by the board of trustees at their meeting on April 28, 1933:

That all graduate study be offered in a graduate school beginning with the year 1934-35, and that this school have an organization and administration analogous to that of the other separate schools and colleges of the university and with a dean at its head.

COLLEGE OF LIBERAL ARTS

General trends.—The outstanding development in connection with the college of liberal arts during the current year was the action of the board of trustees under date of April 28, 1933, combining all the departments of undergraduate study in the college of liberal arts at the end of the next academic year (1933-34). As a result of the continuing economic depression, the enrollment of the college declined by 138, or 20.4 percent, entailing drastic reductions in every item of the budget, including teachers' salaries; the loss of secretarial, administrative, clerical and technical assistants; and the placing of others on half time, during the year.

Inasmuch as this loss was accompanied by a decrease of 223 students, or 30 percent, in the college of education, the trustees were obliged at the close of the year to reduce the faculty of the college of liberal arts by 22 members, to discontinue 2 fellows and an educa-

tional caretaker, and to place 1 other teacher on half time. These changes were worked out in the closest cooperation with the faculty, however, the members of which maintained excellent esprit de corps under the difficult circumstances.

Student enrollment.—The enrollment of students in the several departments is shown in the following table and is based on the average quarterly registration of students for autumn, winter, and spring of the school years 1931–32 and 1932–33. The table shows that every major department in the college experienced a loss of students during the year. The net enrollment of 540 is 110 below the planned enrollment of the college of liberal arts for the normal conditions expected in the 10-year program.

Enrollments in the college of liberal arts by departments

Departments	Number of students		Gain	Loss
	1931–32	1932–33		
Military training—men.....	257	232	-----	25
Physical education—men.....	246	163	-----	83
Physical education—women.....	276	219	-----	57
Freshman orientation.....	-----	46	46	-----
English.....	530	438	-----	92
Mathematics.....	102	97	-----	5
Botany.....	65	54	-----	11
Chemistry.....	205	179	-----	26
Physics.....	77	61	-----	16
Zoology.....	101	74	-----	27
German.....	104	103	-----	1
Latin.....	21	12	-----	9
Romance languages.....	263	172	-----	91
Greek.....	-----	6	6	-----
Commerce.....	83	70	-----	13
Economics.....	98	34	-----	64
History.....	288	227	-----	61
Political science.....	113	71	-----	42
Sociology.....	124	120	-----	4
Philosophy.....	58	45	-----	13
Psychology.....	207	196	-----	11

Graduates.—The college of liberal arts awarded 64 degrees in the year 1932–33. This indicates a net loss of 32 graduates over the number for the preceding year. Of the 64 graduates, 41 received the degree of bachelor of arts, 19 the degree of bachelor of science, and 4 the degree of bachelor of science in commerce. Forty-four of the graduates were men and 20 were women.

Teaching staff.—The following table shows the teaching staff of the college of liberal arts for 1932–33 as compared with the staff for 1931–32. A net loss of 11 teachers is indicated. Five teachers returned from leave of absence, 3 of them with the doctor of philosophy degree. There are now 26 members of this faculty who hold the degree of doctor of philosophy.

Teaching staff of the college of liberal arts

Rank	Year		Gain	Loss
	1931-32	1932-33		
Professors.....	20	17	-----	3
Associate professors.....	13	13	-----	-----
Assistant professors.....	23	17	-----	6
Instructors.....	32	27	-----	5
Assistants.....	6	9	3	-----
Total.....	94	1 83	3	14
Net loss.....	-----	-----	-----	11

¹ This number was reduced by 22 on June 30, 1933.

Twelve members of the faculty were on leave of absence during the year for the purpose of carrying on graduate studies. At the April meeting of the board of trustees, in view of the decreasing enrollment of this college and the college of education, the services of 22 members of this faculty were terminated and 1 other member was placed on half time.

One of the most painful elements in the loss of teaching service was the temporary discontinuance of native teachers of high qualification in the department of German and romance languages. It is the purpose of the administration to reappoint such teachers at the earliest possible opportunity.

THE COLLEGE OF EDUCATION

General trends.—The most significant development in connection with this college during the year was the vote of the board of trustees that all departments of undergraduate study be combined in the college of liberal arts at the end of the next academic year (1933-34). This vote of the board is not interpreted to mean any lessening of interest in the preparation of teachers, as it was accompanied by a further vote of the board providing that the courses in education be so reorganized that there shall be offered in the college of liberal arts and in the form of undergraduate majors sufficient courses and of a character to afford adequate concentration to prepare for graduate or professional study in this field.

Student enrollment.—The enrollment in the college of education declined from 746 in 1931-32 to 523 in 1932-33, a loss of approximately 30 percent. This decrease is a continuation of the drop which began in 1930-31 after the peak in enrollment of 919 in the year 1929-30. This decline can be ascribed primarily to the general economic situation, the published reports of an oversupply of teachers, together with the manifest difficulties attending the teaching profession during the depression and the increased competition from colleges where the costs are less.

The following table exhibits the enrollment in the college of education, undergraduate and graduate, for a period of 7 years, beginning 1926-27. The table also shows the growth in the number of full-time teachers.

Number of full-time teachers and undergraduate and graduate enrollment of the college of education for the period 1926-27 to 1932-33

Year	Full-time teachers	Undergraduate		Total students	Graduate
		Male	Female		
1926-27	2	144	508	652	0
1927-28	3	162	579	741	1
1928-29	4	193	643	836	2
1929-30	8	206	713	919	15
1930-31	11	175	633	808	25
1931-32	¹ 15	163	503	746	77
1932-33	² 14	113	410	523	51

¹ 1 on leave of absence.

² 2 on leave of absence.

Graduates.—In 1932-33 there were 122 graduates of the college of education. Ninety-six degrees of bachelor of arts and 26 degrees of bachelor of science in education were awarded. These figures show a decrease of 19 graduates under the number for the year 1931-32. In the graduate division 51 students were working for the master's degree in the field of education. Of 34 master's degrees granted, 10 were in the field of education.

Teaching staff.—There were 12 members of the faculty of education during the year 1932-33: Professors, 3; associate professors, 2; assistant professors, 2; instructors, 4; assistants, 1. The college was assisted by 10 other part-time teachers belonging to the faculties of liberal arts, applied science, and music. One member of the faculty resigned during the year to accept the leadership of the State side of Wilberforce University. Two teachers were on leave of absence for graduate study. The dean returned from a year's sabbatical leave during which he studied as a Rosenwald fellow at Columbia University. The members of the faculty published 20 scholarly articles during the year and carried the *Journal of Negro Education* through its first successful year. That this journal is meeting a real need in the literature of education is indicated by the comments received from both American and foreign educators.

At the end of the year three teachers were discontinued as part of the university's necessary financial retrenchment.

Student teaching.—During the current year, student teaching has been particularly satisfactory. Sixty-one student teachers did practice teaching in nine of the public schools of the District of Columbia and two in Howard University. These students practiced in a total of 15 different subjects as majors. The university is much indebted to the officers and teachers of the public-school system for their cordial cooperation in the matter of practice teaching.

COLLEGE OF APPLIED SCIENCE

Organization and curricula.—The college of applied science has customarily offered 6 curricula in 4 major departments as follows: Architecture, art, home economics, and engineering—including the curricula of civil, electrical, and mechanical engineering, and building construction. By vote of the board of trustees, the courses in electrical engineering, civil engineering, mechanical engineering, and architecture are to be dropped at the end of the next academic year, 1933–34, and the course in home economics is to be so reorganized that there shall be offered in the college of liberal arts and in the form of undergraduate majors sufficient courses and of a character to afford adequate concentration to prepare for graduate or professional study in this field.

Enrollment.—During the year 1932–33, 177 students enrolled in the classes of the college of applied science as compared with 180 for the previous year, representing a net loss of 3. The 77 students seeking degrees in applied science during the year 1932–33, however, represented an actual increase of 9 over the 68 candidates for degrees in 1931–32.

Teaching staff.—The faculty of the college of applied science included 15 full-time and 3 part-time members during the year 1932–33, distributed as follows: Professors, 0; associate professors, 3; assistant professors, 4; instructors (full time), 8; instructors (part time), 3. The members of the faculty were distributed among the departments as follows: Architecture—1 associate professor, 2 assistant professors, 1 instructor (full time), and 1 part-time instructor; art—1 associate professor, 4 instructors; engineering—1 associate professor, 1 assistant professor, 2 instructors; home economics—1 assistant professor, 1 instructor (full time), 2 instructors (part time).

Two members of the faculty were on leave of absence for further study. Three teachers received distinction during the school year 1932–33 as follows: 1 in local architectural competition and 2 in national art competitions. Two members of the faculty were released without prejudice at the end of the school year as part of the university's financial retrenchment program.

One associate professor in the department of architecture returned from 2 years of study and travel in the United States and in Europe, devoted primarily to the study of housing for workers with low income.

MUSIC

Organization.—As a consequence of their vote to establish a single undergraduate college beginning with the school year 1933–34, the trustees are to appoint a special committee to study and report upon the readjustment of the courses in music to the graduate and undergraduate schools.

Enrollment.—The average enrollment of students in the school of music per quarter during the school year 1932–33 was 118 as compared with 121 for the school year 1931–32. There was a total of 27 degree students, 10 men and 17 women, 24 less than the number enrolled in 1931–32. This decline in enrollment was undoubtedly due to the same factors as those operating in the college of liberal arts and education, plus the additional consideration that the fees in music are much higher.

Graduates.—In 1932–33, there were 4 students who were graduated with the degree of bachelor of music—2 in the department of piano and organ, and 2 in the department of voice. This is an increase of 1 over the number of graduates for 1931–32.

Teaching staff.—The faculty of the school of music for the school year 1932–33 included 10 members, as follows: Professors, 2; assistant professors, 2; instructors, 6. One member of the faculty returned from leave of absence during the year to resume instruction in piano and methods. Two members secured leave of absence for further study during the school year 1933–34.

MILITARY SCIENCE AND TACTICS

1. *Enrollment.*—The enrollment in military science and tactics during the year 1932–33 was as follows: Autumn quarter, 246; winter quarter, 231; spring quarter, 219; average for the year 232.

2. *Courses.*—The work is divided into two courses. The basic course, which is compulsory, and the advanced course of the juniors and seniors, which is elective.

3. *Commissions.*—Twenty-four students were awarded commissions as second lieutenants of infantry, Army of the United States.

4. *Teaching staff.*—The teaching staff of the department of military science and tactics includes 5 members as follows: Professors 1, assistant professors 1, assistants 3.

SUMMER SCHOOL

The summer school of 1932–33, continued for 6 weeks, registered 291 students from 26 States and 2 foreign countries, of whom 231 were women and 60 were men. These students were distributed as follows: College of education 170, college of liberal arts 60, college of applied science 9, school of music 4, graduate division 40, special students 8.

Forty-nine courses were offered by 26 teachers, all of whom were regular members of the faculty of the university.

At the end of the session there were 24 graduates: 13 from the college of education, 7 from the college of liberal arts, and 1 from the college of applied science.

Beginning with the school year 1933–34, by vote of the board of trustees, the summer school will be discontinued.

SCHOOL OF MEDICINE

The school of medicine is the entire medical unit of the university. It includes the colleges of medicine, dentistry, and pharmacy. Freedmen's Hospital, an independent institution built on grounds owned by the University, is functionally a part of the university medical unit.

THE COLLEGE OF MEDICINE

General trends.—Effort was concentrated upon continued improvement in the preclinical departments. Two full-time, well-trained teachers were added to the faculty—1 in anatomy, 1 in pediatrics. Improved facilities for instruction were provided in some of the smaller rooms and laboratories.

Many essential pieces of scientific apparatus and equipment were provided. Instruction was improved by dividing classes into two sections for laboratory work. The circulation of books and periodicals in the medical library for the year was 36,986; the number of readers was 57,474. These figures more than doubled over the previous year.

Enrollment.—In 1932-33, 206 students were enrolled in the college of medicine; of these, 6 were women. The depression had little effect upon the enrollment for the year. The losses were chiefly due to the dropping of poor students at the end of the previous year.

Graduates.—In June 1933, the degree of doctor of medicine was conferred upon 42 candidates as compared with 55 in 1932.

Internships.—All of the 42 graduates of this year's class have been appointed to internships approved by the council on medical education, licensure, and hospitals. Twenty-three of this number secured internships in the Freedmen's Hospital.

Faculty.—The faculty of the college of medicine in 1932-33 included a total of 102 teachers of all ranks, a decrease of 2 under the total of 104 for 1931-32. Of these 102 teachers 16 were on full time and 86 on part time, together representing a full-time equivalent of 28.9 teachers. During the year, 4 members of the staff engaged in significant research in anatomy, pharmacology, bio-chemistry, bacteriology, preventive medicine, and public health. Five scientific papers were published and seven others accepted for publication.

Hospital relations.—The relation of the college of medicine with the Freedmen's Hospital continues to be most cordial and to improve in functioning. The medical council of the hospital is now composed of the surgeon in chief of the hospital, the dean of the school of medicine, and the heads of the clinical departments. The heads of the preclinical departments in the school of medicine are members of the hospital staff. With one exception, every member of the hospital staff is a member of the university faculty. The new out-patient department of the hospital adds greatly to facilities for clinical teaching.

These facilities are still defective for teaching tuberculosis and acute contagious diseases. It is hoped that these needed teaching resources may be provided at some early date by additions to the Freedmen's Hospital.

COLLEGE OF DENTISTRY

General trends.—There is a manifest and urgent need for an increased number of dentists to serve the Negro population of the United States. The State of Mississippi, for example, with over a million Negro population has only 29 Negro dentists. In spite of this need, the attendance of Negro students in dental schools in the United States has not only not increased in recent years but has decreased steadily from 213 in 1928 to 86 at the present time. The faculty of dentistry recognizes the working of retarding factors here which were in existence before the depression came. They are undertaking to counteract these tendencies and to reestablish a normal stream of able students entering the profession of dentistry.

Further improvement has been made in the curriculum by expansion of the didactic course in orthodontia to include laboratory and clinical instruction. Oral pathology has been widened in scope to include a laboratory course.

Enrollment.—Thirty-eight students enrolled in the college of dentistry during 1932-33, one of whom was a graduate student who devoted the year to clinical operative dentistry. This number indicates a loss of 15 as compared with 1931-32. The freshman class, however, was short by only two. The greatest decrease has been due to failures.

Graduates.—Eighteen candidates were awarded the degree of doctor of dental surgery as compared with seventeen in 1931-32. Graduates of the college have shown steady improvement in the State board dental examination during recent years. This is undoubtedly an outgrowth of the recent reorganization of the college, the raising of its entrance requirements, and the general improvement of its curriculum and morale.

Teaching staff.—The teaching staff of the college of dentistry continued to include 14 members in 1932-33, 11 of whom were on full time and 4 on part time. The trustees postponed possible reductions in this faculty until 1933-34, after further study. One member of the staff pursued graduate study during the year and the dean was awarded the degree of master of science in dentistry by Northwestern University for research in dental pathology.

Further improvement.—The college of dentistry stands in very great need of improvements in the physical plant to enable the faculty to make use of available space for educational laboratories and classroom.

COLLEGE OF PHARMACY

General trends.—Students registered for the first time in the 4-year course in pharmacy required by the American Association of Colleges of Pharmacy, of which this college is a member. The physical equipment of the college was greatly improved by the installation of new and modern laboratories for pharmacy and pharmaceutical chemistry, as well as research and preparation laboratories with necessary store rooms and offices. Important additions were made also to the scientific apparatus of the college.

Enrollment.—Twenty-three students registered in the college of pharmacy for all classes as compared with thirty-two during 1931–32.

Graduates.—There were 10 graduates in 1932–33 as compared with 13 for 1931–32. Seven students were graduated from the 3-year course leading to the degree of pharmaceutical chemist and 3 from the old 4-year course leading to the degree of bachelor of science in pharmacy.

Faculty.—The faculty still consists of 5 members, 4 of whom are on full time and 1 on part time, as follows: Professors 2 (full time), associate professors 1 (full time), instructors 2 (1 full time, 1 part time).

Future of the college.—In considering the reorganization of the university, the trustees were uncertain about the future of the college of pharmacy, postponing the question of its continuance until the October meeting, 1933.

SCHOOL OF LAW

Enrollment.—Student enrollment in law took a further drop from 63 in 1931–32 to 42 in 1932–33. There were no special students in the school. The decrease in enrollment, it is believed, was due wholly to the economic depression. Offsetting the decrease in enrollment is a decided improvement in the caliber of the student body. Of the 16 students entering the freshman class, 10 held degrees and 2 others had had 4 years of college training. The school is now in position to do more intensive and scholarly work.

Graduates.—Eight degrees were awarded for the year 1932–33 as compared with eighteen during the previous year. Eight of the thirteen graduates of the new day class of 1931 are in the active practice of law and 10 of the 14 graduates of 1932 are in active practice. These graduates are located in eight States and the District of Columbia.

Library and physical equipment.—The library of the school contains 14,411 volumes as of June 30, 1933, an increase of 563 volumes over 1932. The physical plant is outgrown and otherwise inadequate. The trustees have voted to move the school into the building on the main campus formerly devoted to a dining-room commons as soon as money is available for alterations.

Faculty.—The faculty of the school of law for 1932–33 included 10 members, 4 of whom were on full time and 6 on part time, distributed as follows: Professors 5 (2 full time, 3 part time), associate professors 1 (full time), assistant professors 2 (1 full time, 2 part time), lecturers 1 (part time).

SCHOOL OF RELIGION

The school of religion receives no aid from Government appropriations. It is entirely supported from a small endowment and from private gifts. The dean reports that the year 1932–33 was in some respects the best of several years.

Students.—The total number of students in the school of religion was 64, an increase of 13 over last year. This was the largest enrollment in many years. Of this number 16 were enrolled in the graduate department and 48 in the theological college. The evening classes were conducted, as usual, with a registration of 16 students. The extension department was also maintained, giving aid by correspondence to more than 100 persons, mostly pastors. Only one extension institute was held during the year, largely because the schools at Fayetteville and Sedalia, N.C., were unable to finance their part of the program, as they had formerly done. Class work was reported satisfactory and the students were enthusiastic over their studies, but the strain of meeting their economic problems was very severe.

Faculty.—There was one death on the faculty. Two full-time members were added. Total faculty for the year: 11—4 on full time, and 7 on part time. Together these faculty members represented a full-time equivalent of $6\frac{1}{3}$ teachers. The school needs a minimum of 8 full-time teachers to continue its graduate division alone.

Organization and curricula.—For many years this school has conducted five divisions of work: Graduate, theological college, evening school, correspondence, and extension institutes. Beginning with the school year 1933–34, by vote of the board of trustees, the correspondence, evening school, and theological college courses will be discontinued, and the school of religion will thereafter proceed solely as a graduate school.

PERSONNEL

The registrar.—The registrar of the university conducts all of the correspondence incident to the appraisal of the scholastic standing of all students desiring to enter Howard University and issues cards of admission when it has been determined that students have met the entrance requirements of the school or college concerned. He keeps an accurate record of the work of all students in the university, stores the same in fireproof safes, and makes them available through transcripts upon demand. He also keeps a careful record of the graduates of the university and renders invaluable service to the educational life and problems of the student. During the school year 1932–33

the personnel of the registrar's office consisted of 1 chief clerk and 7 clerks.

University health service.—The Howard University health service was operated during the school year 1932-33 by 1 full-time physician and 2 part-time physicians, 1 of whom was a woman; 2 nurses, a secretary, and 3 part-time student orderlies. In addition to the central office in the Gymnasium Building, the department maintained an infirmary in both the men's and women's dormitories, the men's infirmary being an addition of this year. The department also enjoyed the cooperation of the staff and the use of the facilities of the Freedmen's Hospital and the Howard University medical, dental, and pharmaceutical colleges. Special use was made of the X-ray unit in the medical school and of a basal metabolism testing booth set up there just as the school year closed.

Complete physical examinations of entering students were made with a tuberculin skin test for tuberculosis with X-ray follow up, and a hearing test was made on all incoming male students. The hearing test and the Wassermann work were new this year.

The athletes of the university were examined at the beginning of each sport season and a physician was present at all contests for advice and care of accidents. Twenty-five applicants for the summer camp of the Reserve Officers Training Corps were inoculated against typhoid and para-typhoid fever, and vaccinated against smallpox.

The care of illnesses in the university included 4,000 office consultations with treatment, 30 women in the women's infirmary, 25 men in the men's infirmary, and 10 hospital cases.

The health of the university presented few outstanding problems. Mild epidemics of influenza and chicken pox were controlled. Illnesses were definitely confined to early stages of disease through vigorous care. Contagion was isolated, whenever it appeared, and only one death was caused—scarlet fever—in which case the parents furnished medical care.

The staff of the university health service is allied with the American Association of School Physicians and the American Student Health Association.

Deans of men and women.—The dean of men and the dean of women supervise the housing of students, both in the dormitories and in the city, and undertake programs of social guidance related to all the extra-curricula activities of students and their choice of careers. They also endeavor to help students with their personal problems. Both of these offices report acute distress among the students on account of the depression. Both endeavored, as usual, to relieve this distress by securing part-time employment for students in need. The efforts of the dean of women this year were successful within the walls of the university alone, where, in various divisions, approximately 100 part-time positions were available. The dean of men

found himself confronted with a drastic reduction in work opportunities available for needy students outside the university walls. During the years 1927-29 he was able to secure an average of \$40,000 worth of work per year for male students. During the year 1932-33 it was possible to secure only \$1,200 worth of new work for students. Many of the male students continued on old jobs at greatly reduced wages. In many cases where students once received \$20 a month and board, during the past year they received board only. Both the dean of men and dean of women report a superior scholastic record among students occupying the dormitories and both draw attention to the need for greatly increased amounts available for scholarships and student aid.

Staff.—The staff of the office of the dean of women for the school year included 2 directors of residence, 1 housekeeper, and 1 dietitian. The staff of the dean of men included 1 part-time assistant to the dean of men, 1 social director, and 1 housekeeper (part time).

THE LIBRARY

During the year 1932-33, 7,387 volumes were added to the library of the university, bringing the total library accessions in all divisions up to 78,849 volumes, exclusive of pamphlets estimated at 35,000. Four hundred and ninety-eight periodicals are currently received by subscription.

Moorland Foundation.—The Moorland Foundation, completing a very successful year of library service in the field of Negro literature, has outgrown its present quarters and has extended its shelves into the third-floor stacks. There are now 6,499 items, including 3,528 books and 2,971 pamphlets. On March 7, 1933, 883 volumes had been added. Many were contributed by the founder. The main room was used by 784 readers.

Use of the library.—The general library circulated 54,797 volumes during the year, with a daily average circulation of 182. The medical library reported a circulation of 36,986 volumes. The law library loaned 164 volumes. Dentistry circulated 2,032 volumes. In the Moorland room, 1,182 books were used.

Veterans' Bureau gift.—From the generous gift of books from the war-time Veterans' Bureau collection made by the Federal Government, 8,357 volumes have been loaned during the year to 10 educational institutions.

Further development of the library.—The general library has need of more space, more help, and more money for books. The present building has reached and passed capacity for accommodating the books, staff, faculty, and students of the university. This is now a matter of common knowledge in the educational world which is interested in the growth of Howard University.

BUILDINGS AND GROUNDS

The following table shows the building projects by number, authorized by the Government, and in process during the year 1932-33.

Building program in process, 1932-33

No.	Description of project	Date authorized	Authorized limit of cost	Total amount appropriated
2	Construction and equipment of a chemistry building.....	May 4, 1929	\$399,000	\$390,000
4	For excavation, grading, walks, walls, fencing, landscaping, etc., of university grounds.	Feb. 6, 1931	200,000	200,000
5	Construction and equipment of a general library building.	Feb. 14, 1931	800,000	800,000
6	Reconstruction of underground system of distributing heat, light and power, etc.	Feb. 14, 1931	225,000	225,000
7	For completing the construction of an educational classroom building.	Feb. 14, 1931	460,000	460,000
8	For the construction and equipment of a heat, light, and power plant.	Feb. 17, 1933	460,000	460,000

FINANCES

Financial administration.—The administration of university finances was thoroughly reorganized during the year. The office of secretary-treasurer was divided into the two offices of secretary and treasurer, the secretarial office being retained by the former secretary-treasurer, and a new treasurer was elected. All finances and business administration of the university were concentrated in the treasurer's office which was re-defined by trustee statute. The entire financial system of the university was surveyed by experts and the system of accounting revised to conform with a system agreed upon by the American Association of Colleges. All trustee committees formerly engaged in financial supervision of any sort were combined in the finance committee, whose duties and powers were re-defined.

The total assets of the university at June 30, 1933, were \$6,277,-982.25 exclusive of unexpended balances of Government appropriations for the chemistry building, the classroom building, the library, and the heat, light, and power plant, all temporarily impounded by the Federal Government. Of the total assets \$1,073,453.72 represented assets in a physical plant-extension fund made available from private sources; \$860,884.47 represented endowment; \$4,078,422.87 represented plant-fund assets. The remainder represented assets of the current fund.

Economical administration made possible an excess of income over expenditures in the amount of \$23,654.88, applicable to the retirement of the accumulated deficit.

The auditing of all of the university's accounts has been done by certified public accountants. All moneys appropriated by the Congress were expended under the supervision of the Department of the Interior.

FREEDMEN'S HOSPITAL

(W. A. WARFIELD, M.D., Surgeon in Chief)

During the last fiscal year, the wards of Freedmen's Hospital were filled to capacity and frequently applicants in need of hospitalization could not be received, there being no beds available.

The same administrative difficulties experienced in former years on account of the Saturday half-holiday still exist. The hospital must function 24 hours a day and seven days a week, and with the present force it has been found impossible to comply literally with the terms of the law. This condition is most acute with the force of employees in the power plant during the winter months, and with the nursing department during the entire year.

PATIENTS

At the close of the last fiscal year there were 230 patients remaining in the hospital. During the year, 4,909, including births, were admitted, making a total of 5,139 indoor patients under care, as against 4,928 the preceding fiscal year.

Of the number admitted, including births, 738 were pay patients, 1,326 were indigent residents of the States, and 2,845 were indigent residents of the District of Columbia. There were discharged during the year, including births, 4,888, of whom 2,388 had recovered, 2,016 improved, 168 unimproved and 316 died, leaving 251 in the hospital July 1, 1933, of which number 31 were pay patients, 73 indigent residents of the States, and 147 indigent residents of the District of Columbia.

Notwithstanding 32 percent of the deaths occurred within 48 hours after admission, the mortality rate was only 6 percent for the year. Autopsies were performed on 32.2 percent of all deaths. There were 2,019 surgical operations, of which number 967 were major in character. In the dental department 1,951 received treatment. Nine thousand three hundred and nineteen were treated in the out-patient department and 7,191 in the emergency department, making a total of 16,510.

The following table shows the number of visits to the various clinics:

Clinic	Number of visits	Clinic	Number of visits
Dermatology.....	3, 650	Oral surgery.....	248
Ear.....	333	Orthopedic.....	3, 261
Nose.....	279	Pediatric.....	2, 010
Throat.....	2, 146	Prenatal.....	263
Eye.....	1, 442	Postnatal.....	1, 334
Urological.....	7, 866	Surgical.....	9, 327
Gynecological.....	3, 186	Tubercular.....	250
Medical.....	5, 474		
Neurological.....	910	Total.....	41, 979

The total number of patients receiving the benefits of the hospital was 21,649, or 1,437 more than the preceding year.

SOCIAL SERVICE

In reviewing the work of this department for the past year, it appears that much has been done toward strengthening the foundation laid in its first 2 years of existence. In September a new educational program began to function with two or our recent graduate nurses. Both students adjusted themselves admirably to the program in teaching prevention and health conservation.

DIETARY DEPARTMENT

Considerable progress has been made in this department, especially along educational lines in the Out-patient Department Clinic. The interne dietitian's course was approved by the American Dietitian Association. The demand for dietary service is far greater than the present force can satisfy. Two additional dietitians are urgently needed.

NEEDS

The outstanding and most urgent need of the hospital is a larger personnel. It is a problem of long standing and is steadily becoming more acute. This is particularly true in the nursing service and power plant.

The graduate and student nurses work from 44 to 52 hours a week, exclusive of class and hours of study. The remedy can only be found in the employment of 17 additional graduate nurses at \$21,420 per annum, who should carry the greater part of the nursing load if the patients are to receive the best of care and the training school is to measure up fully to the present-day demands of nursing education.

The service is greatly in need of an electrician at \$1,680 per annum. There are more than 60 motors of various sizes and many electrical appliances—lighting and power circuits—in the institution requiring

the attention of an electrician. The engineer, who has some knowledge of electrical work, has labored many extra hours in this kind of service to keep the plant going, which takes him from the engine room many times when he is needed there.

Two additional firemen at \$2,640 per annum would enable the hospital to comply with the 8-hour law. A clerk at \$1,440 is urgently needed in the social service department. This branch of the hospital service has two workers with no regular clerk. When possible a clerk is detailed from some other department for an hour or so each day, which is in no way satisfactory to either service.

THE SCHOOL OF NURSING

The nursing service during the past year has been good. The addition of the pediatric ward and the new clinical building have greatly increased the facilities for the training of student nurses. This service has been considerably handicapped on account of the great amount of illness among the student nurses. This has been attributed to the heavy nursing load, long hours on duty, and a large class schedule.

Statistical summary

	1933					1932				
	Colored		White		Total	Colored		White		Total
	Male	Female	Male	Female		Male	Female	Male	Female	
In hospital July 1, 1931.....						24	18			42
In hospital July 1, 1932:										
Pay patients.....	16	18			34					
Indigents:										
United States.....	38	41			79	30	38			68
District of Columbia.....	64	53			117	31	47			78
Total.....	118	112			230	85	103			188
Admitted:										
Pay patients.....	253	418	1		672	274	442	2		718
Pay patient births.....	32	34			66	46	32	1	1	80
Indigents:										
United States.....	407	761	3		1,171	553	671	3	1	1,228
District of Columbia.....	878	1,429	10	2	2,319	892	1,248	5	2	2,147
Births:										
United States.....	74	81			155	131	98	1		230
District of Columbia.....	252	273		1	526	164	173			337
Total admitted.....	1,896	2,996	14	3	4,909	2,060	2,664	12	4	4,740
Total indoor under care.....	2,014	3,108	14	3	5,139	2,145	2,767	12	4	4,928
Stillbirths:										
Pay patients.....	1	2			3	3	3			6
Indigents.....	30	27			57	33	25			58
Total.....	31	29			60	36	28			64
Discharge, including births:										
Pay patients:										
Recovered.....					397					390
Improved.....					283					335
Unimproved.....					9					21
Total.....					689					746
Indigents:										
Recovered.....					1,991					1,866
Improved.....					1,733					1,591
Unimproved.....					159					148
Total.....					3,883					3,605

Statistical summary—Continued

	1933					1932				
	Colored		White		Total	Colored		White		Total
	Male	Fe-male	Male	Fe-male		Male	Fe-male	Male	Fe-male	
Deaths:										
Pay patients.....	27	24	1		52	34	26			60
Indigents.....	137	127			264	133	152	2		287
Total.....	164	151	1		316	167	178	2		347
Grand total discharges.....					4,888					4,698
In hospital July 1, 1933:										
Pay patients.....	13	18			31	16	18			34
Indigents:										
United States.....	26	46	1		73	38	41			79
District of Columbia.....	62	85			147	64	53			117
Total.....	88	131	1		220	102	94			196
Grand total remaining.....	101	149	1		251	118	112			230
Day's maintenance:										
Pay patients.....					11,237					19,616
Indigents:										
United States.....					24,498					25,897
District of Columbia.....					49,301					36,110
Total.....					85,036					81,623

	1933	1932
Cost per patient per day.....	\$3.10	\$3.56
Largest number of indigents at any one time.....	249	232
Smallest number of indigents at any one time.....	168	130
Daily number of patients, pay and indigent.....	232	225
Average number of days' hospitalization per patient.....	16.48	15.28
Daily average number of patients, outdoor.....	138	113
Number of indigents admitted from District of Columbia, including births.....	2,845	2,480
Number of prescriptions compounded:		
Indoor.....	34,297	32,043
Outdoor.....	22,397	18,083

FINANCIAL STATEMENT

Receipts and disbursements on account of pay patients

	1933	1932
RECEIPTS		
Private-room patients, at \$2 per day.....	\$6,332.00	\$7,076.00
Ward patients, at \$2 per day (Veterans' Administration).....	7,128.00	8,884.00
Ward patients, at \$1.75 per day.....	7,134.25	8,333.50
Children, at \$1 per day.....	168.00	168.00
Babies, at 50 cents a day.....	209.00	299.00
Use of operating rooms.....	1,407.00	1,322.00
X-ray photos (including \$520 for Veterans' Administration patients).....	1,155.00	1,447.00
Other charges (including \$278 for Veterans' Administration patients).....	453.00	755.00
Total.....	23,986.25	28,284.50
DISBURSEMENTS		
Subsistence.....		2,979.98
Medical and surgical supplies.....	4,051.35	4,163.04
Miscellaneous (dry goods, repairs, fuel, etc.).....	18,030.17	20,278.46
Refund of overpayment by patients.....	209.25	282.25
Total.....	22,290.77	27,703.73
Unexpended balance.....	1,695.48	580.77

Receipts and disbursements, 1933

RECEIPTS

Appropriation, Interior Act:	
Salaries.....	\$198,980.00
For support.....	94,500.00
	<hr/>
	293,480.00
Second Deficiency Act, 1932.....	75,052.59
From pay patients.....	15,418.25
From Veterans' Administration.....	8,568.00
From Howard University.....	37,279.15
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Total.....	429,797.99

DISBURSEMENTS

Miscellaneous, appropriation (fuel, light, clothing, medicine, etc.).....	44,885.29
Miscellaneous, pay patient (fuel, light, clothing, medicine, etc.).....	14,426.54
Miscellaneous, Veterans' Administration (fuel, light, clothing, medicine, etc.).....	7,654.98
Miscellaneous, Howard University (fuel, light, clothing, medicine, etc.).....	35,898.97
Subsistence appropriation.....	48,732.13
Salaries.....	171,623.45
Clinical addition.....	74,698.12
Refunds, pay patients.....	209.25
	<hr/>
Total.....	398,128.73

UNEXPENDED BALANCE

Miscellaneous appropriation.....	614.71
Subsistence appropriation.....	267.87
Salaries (including \$24,383.49 furlough and compensation deductions).....	27,356.55
Pay patient.....	782.46
Veterans' Administration.....	913.02
Howard University.....	1,380.18
Clinical addition (including \$304.82 furlough and compensation deductions).....	354.47
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Unexpended balance, total.....	31,669.26

COLUMBIA INSTITUTION FOR THE DEAF

(PERCIVAL HALL, M.A., Litt.D., President)

During the fiscal year ending June 30, 1933, there were under instruction in the advanced department of the institution, known as Gallaudet College, 85 men and 64 women, a total of 149, representing 33 States, the District of Columbia, and Canada. This is an increase of one as compared with the preceding year. In the primary and grammar department, known as the Kendall School, there were under instruction 38 boys and 27 girls, a total of 65. This is an increase of one as compared with the preceding year. Of the total in this department 63 were admitted as beneficiaries of the District of Columbia. There were admitted to the institution 32 males and 30 females; discharged, 24 males and 23 females.

The health of students and pupils during the year has been excellent. Preventive measures are taken regularly in connection with more serious contagious diseases which have kept our student body free from most of such troubles. One case of tuberculosis was discovered during the year and sent to a sanitarium for private treatment. A few surgical cases, including 1 fractured clavicle and 1 fracture of the small bone of the leg, were successfully treated.

Continued care was given to the production of our milk supply. A modern outfit for the sterilization of all cans and bottles used at the dairy was installed, and regular weekly examination of the milk product for bacteria was continued. The usual physical training of all students was continued under competent instructors. The regular courses of study both in Gallaudet College and in the Kendall School remained unchanged during the year.

NEEDS OF THE INSTITUTION

Attention has been called during the past few years to the need of a building for library and instruction purposes, which would relieve crowding in the men's dormitory, provide more recitation rooms, and better accommodations for our print shop and our valuable library. It has been 15 years since any serious building project has been undertaken. This building should be erected in the near future, and an addition made to the gymnasium, which is now about 50 years old, so that it may accommodate modern basketball contests. There is further need for dormitory space for the pupils of the Kendall School,

a new shop building, and an addition to the laboratory; also a new primary recitation building. The grounds should be surrounded by a modern steel fence on all except the Florida Avenue frontage.

The salary scale of the employees has never been as high as it should be. Many of our workers are experts in the instruction of the deaf, and could command higher salaries in other institutions. The restoration of the old wage level should be made as soon as possible, and readjustments in addition to this should place our teaching force at least on a par, in this respect, with any similar institution.

A research department should be established to study problems of the deaf as urged by the Conference of Executives of American Schools for the Deaf, the Convention of American Instructors of the Deaf, and the National Research Council. At the present time one research worker, supported by the National Research Council, has been making important studies as to the motor coordination of deaf children compared with hearing persons. This, however, is only a temporary arrangement.

Combined statement of the disbursing officer and the treasurer of receipts and expenses for the fiscal year ended June 30, 1933

RECEIPTS

	Appropriated funds	Special deposits	Total
United States appropriation.....	\$128,000		\$128,000.00
Payment by District of Columbia.....		\$31,500.00	31,500.00
Sundry receipts.....		14,237.38	14,237.38
Balance on hand July 1, 1932.....			
Total.....	128,000	45,737.38	173,737.38

EXPENSES

	Appropriated funds	Special deposits	Total
Personal services.....	\$75,787.16	\$23,117.83	\$98,904.99
Supplies and materials.....	27,785.68	7,253.49	35,039.17
Subsistence and support of persons.....		47.00	47.00
Subsistence and care of animals, etc.....		11.25	11.25
Communication service.....	1,503.64	292.91	1,796.55
Travel expenses.....	28.00	172.28	200.28
Transportation of things.....	51.25	37.34	88.59
Printing and binding.....		234.62	234.62
Advertising and publication of notices.....		4.24	4.24
Furnishing heat, light, etc.....	346.70	48.79	395.49
Rents.....		319.77	319.77
Repairs and alterations.....	12,643.03	7,924.62	20,567.65
Special and miscellaneous.....		278.50	278.50
Equipment.....	1,986.57	2,568.96	4,555.53
Stores purchased for resale.....	257.26	1,289.62	1,546.88
Total.....	120,389.29	43,601.22	163,990.51
Total.....	120,389.29	43,601.22	163,990.51
Impounded in Treasury.....	7,109.18		7,109.18
Reserve returned to Treasury.....	501.53		501.53
Balance on hand July 1, 1933.....		2,136.16	2,136.16
Grand total.....	128,000.00	45,737.38	173,737.38

INVESTED FUNDS

General fund:	
Balance on hand July 1, 1932.....	\$1,047.18
Receipts from coupons and interest.....	201.10
Total.....	1,248.28
Expenses for bond of treasurer and tax on checks.....	113.23
Balance in banks June 30, 1933.....	1,135.05
Manual-labor fund:	
Balance on hand July 1, 1932.....	1,446.10
Interest on savings account and receipts from coupons.....	153.60
Total in banks June 30, 1933.....	1,599.70
Memorial art fund:	
Balance on hand July 1, 1932.....	251.95
Interest on savings account and receipts from coupons.....	13.54
Total in banks June 30, 1933.....	256.49
A. B. Greener fund:	
Balance on hand June 30, 1932.....	4.83
Interest and receipts from coupons.....	1.02
Total in banks June 30, 1933.....	6.85

GALLAUDET MEMORIAL BUILDING FUND

The assets of the Gallaudet Memorial Building Fund, in the hands of the treasurer of the institution, are as follows:

Cash in banks:	
Restricted.....	\$1,591.40
Conservators account.....	611.00
	2,202.40
Mortgage notes receivable, face value.....	23,722.50
Bonds, par value.....	28,000.00
Total.....	53,924.90





